PHILIPS

32PF7520

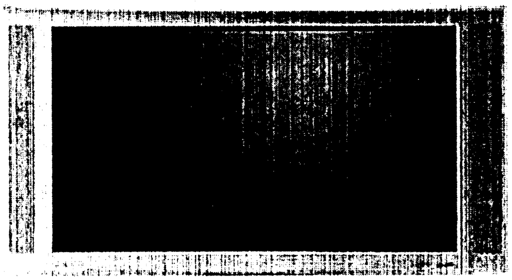
MODEL

SERVICE MANUAL

Colour Television

Chassis
LC4.3E
AA

Service
Service
Service



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Service Manual

Contents **Page**
1. Technical Specifications, Connections, and Chassis Overview 2
2. Safety Instructions, Warnings, and Notes 5
3. Directions for Use 7
4. Mechanical Instructions 8
5. Service Modes, Error Codes, and Fault Finding 14
6. *Block Diagrams, Testpoint Overviews, and Waveforms*
   Wiring Diagram 23
   Block Diagram Video 24
   Block Diagram Audio 25
   Testpoint Overview Small Signal Board 26
   I2C IC Overview 27
   Supply Voltage Overview 28
7. *Circuit Diagrams and PWB Layouts* *Diagram* *PWB*
   SSB: Tuner and VIF (B1) 29 51-60
   SSB: Hercules (B2) 30 51-60
   SSB: Sync Interface (B3) 31 51-60
   SSB: Audio Delay Line (Reserved) (B4) 32 51-60
   SSB: Audio Processing (B5) 33 51-60
   SSB: DC-DC Converter (B6) 34 51-60
   SSB: Diversity Tables B1-B6 35
   SSB: Scaler (B7) 36 51-60
   SSB: Scaler (B8) 37 51-60
   SSB: Scaler Interface (B9) 38 51-60
   SSB: SDRAM (B10) 39 51-60
   SSB: Flash / Control (B11) 40 51-60
   SSB: MUX-Sync Interface (B13) 41 51-60
   SSB: Digital I/O (B14) 42 51-60
   SSB: SCART Analogue I/O (B15) 43 51-60
   SSB: Top Connectors (B16) 44 51-60
   SSB: Side Connectors (B17) 45 51-60
   SSB: ADC (B18) 46 51-60
   SSB: Columbus (B19) 47 51-60

Contents **Page**
   SSB: EPLD (B20) 48 51-60
   SSB: EPLD (B21) 49 51-60
   SSB: Diversity Tables B9-B21 50
   Class D Audio Amplifier (C) 61 62
   Keyboard Control Panel (D) 63 64
   Side A/V Panel (G) 65 66
   IR-LED and Light Sensor Panel (J) 67 67
8. Alignments 69
9. Circuit Descriptions, Abbreviation List, and IC Data Sheets 74
   Abbreviation List 82
   IC Data Sheets 85
10. Spare Parts List 89
11. Revision List 95

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PHILIPS

1. Technical Specifications, Connections, and Chassis Overview

Index of this chapter:

1.1 Technical Specifications
1.2 Connection Overview
1.3 Chassis Overview

Notes:

- Figures can deviate due to the different set executions.
- Specifications are indicative (subject to change).

1.1 Technical Specifications

1.1.1 Vision

Display type : LCD, IPS
Screen size :
- 26PF4310/10 : 26" (66 cm), 15:9
- 26PF5320/10 : 26" (66 cm), 16:9
- 32PF5320/10 : 32" (82 cm), 16:9
- 32PF7320/10 : 32" (82 cm), 16:9
Resolution (HxV pixels) :
- 26PF4310/10 : 1280 x 768
- 26PF5320/10 : 1366 x 768
- 32PF5320/10 : 1366 x 768
- 32PF7320/10 : 1366 x 768
Contrast ratio :
- 26PF4310/10 : 500:1
- 26PF5320/10 : 600:1
- 32PF5320/10 : 600:1
- 32PF7320/10 : 600:1
Light output (cd/m^2) :
- 26PF4310/10 : 400
- 26PF5320/10 : 500
- 32PF5320/10 : 500
- 32PF7320/10 : 500
Response time (ms) :
- 26PF4310/10 : 16
- 26PF5320/10 : 16
- 32PF5320/10 : 18
- 32PF7320/10 : 18
Viewing angle (HxV degrees) :
- 26PF4310/10 : 176x176
- 26PF5320/10 : 178x178
- 32PF5320/10 : 176x176
- 32PF7320/10 : 176x176
Tuning system : PLL
TV Colour systems : PAL B/G, D/K, I
: SECAM B/G, D/K, L/L'

Video playback :
- 26PF4310/10 : PAL B/G; SECAM L/L'
- 26PF5320/10, :
- 32PF5320/10, :
- 32PF7320/10: : NTSC M/N 3.58, 4.43
: PAL B/G
: SECAM L/L'
Supported computer formats : VGA (640x480)
: MAC (640x480)
: SVGA (800x600)
: XVGA (1024x768)
: WXGA (1280x768)
Supported video formats : 640x480i - 1fH
: 720x576i - 1fH
: 640x480p - 2fH
: 720x576p - 2fH
; 1920x1080i - 2fH
Presets/channels : 100 presets
Tuner bands : VHF
: UHF
: S-band
: Hyper-band

1.1.2 Sound

Sound systems : FM-mono
: FM-stereo B/G
: NICAM B/G, D/K, I, L
: AV Stereo

Maximum power (W_{RMS}) :
- 26PF4310/10 : 2 x 5
- 26PF5320/10 : 2 x 5
- 32PF5320/10 : 2 x 15
- 32PF7320/10 : 2 x 15

1.1.3 Miscellaneous

Power supply:
- Mains voltage (V_{AC}) : 95 - 240

- Mains frequency (Hz) : 50 / 60

Ambient conditions:
- Temperature range (°C) : +5 to +40
- Maximum humidity : 90% R.H.

Power consumption
- Normal operation (W) : ≈ 96
- Stand-by (W) : < 1

Dimensions (WxHxD cm) :
- 26PF4310/10 : 79.2 x 43.1 x 24.2
- 26PF5320/10 : 80.45 x 47.7 x 22.2
- 32PF5320/10 : 92.4 x 55.0 x 22.2
- 32PF7320/10 : 92.4 x 55.0 x 22.2

Weight (kg) :
- 26PF4310/10 : 15
- 26PF5320/10 : 16
- 32PF5320/10 : 18.2
- 32PF7320/10 : 18.2

1.2 Connection Overview

Note: The following connector colour abbreviations are used (acc. to DIN/IEC 757): Bk= Black, Bu= Blue, Gn= Green, Gy= Grey, Rd= Red, Wh= White, and Ye= Yellow.

1.2.1 Side I/O connections

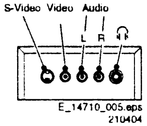

Figure 1-1 Side I/O connections

SVHS (Hosiden): Video Y/C - In

1	- Ground Y	Gnd	⏚
2	- Ground C	Gnd	⏚
3	- Video Y	1 V_{PP} / 75 ohm	→◯
4	- Video C	0.3 V_{PP} / 75 ohm	→◯

Cinch: Video CVBS - In, Audio - In

Ye	- Video CVBS	1 V_{PP} / 75 ohm	→◯◎
Wh	- Audio L	0.5 V_{RMS} / 10 kohm	→◯◎
Rd	- Audio R	0.5 V_{RMS} / 10 kohm	→◯◎

Mini Jack: Audio Head phone - Out

Bk	- Head phone	32 - 600 ohm / 10 mW	◎/🎧

1.2.2 Rear Connections

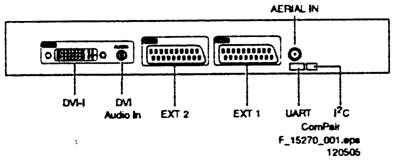

Figure 1-2 Rear I/O

Aerial - In

-	- IEC-type (EU)	Coax, 75 ohm	⊤

Mini Jack: PC-Audio - In

1	- Ground	Gnd	⏚
2	- Audio L	0.5 V_{RMS} / 10 kohm	→◯
3	- Audio R	0.5 V_{RMS} / 10 kohm	→◯

Service connector (ComPair)

1	- SDA-S	I^2C Data (0 - 5 V)	→◯◯→
2	- SCL-S	I^2C Clock (0 - 5 V)	→◯
3	- Ground	Gnd	⏚

Service connector (UART)

1	- UART_TX	Transmit	◯→
2	- Ground	Gnd	⏚
3	- UART_RX	Receive	→◯

DVI-I: Digital/Analogue Video - In

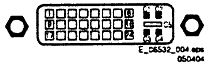

Figure 1-3 DVI-I connector

1	- D2-		→◯
2	- D2+		→◯
3	- Shield	Gnd	⏚
4	- D4-		→◯
5	- D4+		→◯
6	- DDC_SCL	DDC clock	◯→
7	- DDC_SDA	DDC data	→◯◯→
8	- V-sync	0 - 5 V	→◯
9	- D1-		→◯
10	- D1+		→◯
11	- Shield	Gnd	⏚
12	- D3-		→◯
13	- D3+		→◯
14	- +5V		→◯
15	- Ground	Gnd	⏚
16	- HPD	Hot Plug Detect	→◯
17	- D0-		→◯
18	- D0+		→◯
19	- Shield	Gnd	⏚
20	- D5-		→◯
21	- D5+		→◯
22	- Shield	Gnd	⏚
23	- CLK+		→◯
24	- CLK-		→◯
C1	- Video Red	0.7 V_{PP} / 75 ohm	→◯
C2	- Video Green	0.7 V_{PP} / 75 ohm	→◯
C3	- Video Blue	0.7 V_{PP} / 75 ohm	→◯
C4	- H-sync	0 - 5 V	→◯
C5	- Ground	Gnd	⏚

EXT1: Video RGB - In, CVBS - In/Out, Audio - In/Out

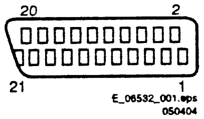

Figure 1-4 SCART connector

1	- Audio R	0.5 V_{RMS} / 1 kohm	◯→
2	- Audio R	0.5 V_{RMS} / 10 kohm	→◯
3	- Audio L	0.5 V_{RMS} / 1 kohm	◯→
4	- Ground Audio	Gnd	⏚
5	- Ground Blue	Gnd	⏚
6	- Audio L	0.5 V_{RMS} / 10 kohm	→◯
7	- Video Blue	0.7 V_{PP} / 75 ohm	→◯
8	- Function Select	0 - 2 V: INT 4.5 - 7 V: EXT 16:9 9.5 - 12 V: EXT 4:3	→◯
9	- Ground Green	Gnd	⏚
10	- n.c.		
11	- Video Green	0.7 V_{PP} / 75 ohm	→◯
12	- n.c.		
13	- Ground Red	Gnd	⏚
14	- Ground	Gnd	⏚
15	- Video Red	0.7 V_{PP} / 75 ohm	→◯
16	- Status/FBL	0 - 0.4 V: INT 1 - 3 V: EXT / 75 ohm	→◯
17	- Ground Video	Gnd	⏚
18	- Ground FBL	Gnd	⏚
19	- Video Terr. CVBS	1 V_{PP} / 75 ohm	◯→
20	- Video CVBS/Y	1 V_{PP} / 75 ohm	→◯
21	- Shield	Gnd	⏚

EXT2: Video Y/C - In, CVBS - In/Out, Audio - In/Out

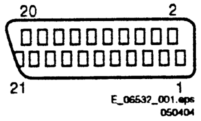

Figure 1-5 SCART connector

1	- Audio R	0.5 V_{RMS} / 1 kohm	◯→
2	- Audio R	0.5 V_{RMS} / 10 kohm	→◯
3	- Audio L	0.5 V_{RMS} / 1 kohm	◯→
4	- Ground Audio	Gnd	⏚
5	- Ground Blue	Gnd	⏚
6	- Audio L	0.5 V_{RMS} / 10 kohm	→◯
7	- n.c.		
8	- Function Select	0 - 2 V: INT 4.5 - 7 V: EXT 16:9 9.5 - 12 V: EXT 4:3	→◯
9	- Ground Green	Gnd	⏚
10	- n.c.		
11	- n.c.		
12	- n.c.		
13	- Ground Red	Gnd	⏚
14	- Ground	Gnd	⏚
15	- YC/C - in	0.7 V_{PP} / 75 ohm	→◯
16	- n.c.		
17	- Ground Video	Gnd	⏚
18	- Ground	Gnd	⏚
19	- Video Mon. CVBS	1 V_{PP} / 75 ohm	◯→
20	- YC/Y - in	0.7 V_{PP} / 75 ohm	→◯
21	- Shield	Gnd	⏚

1.3 Chassis Overview

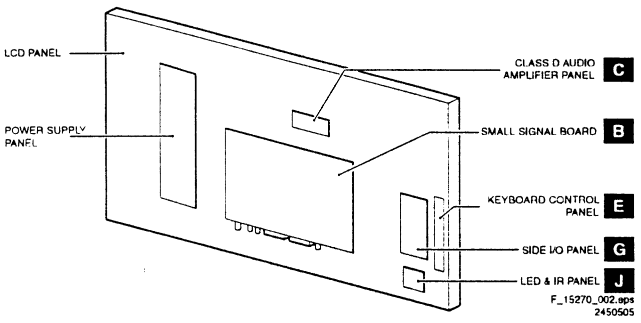

Figure 1-6 Chassis overview

2. Safety Instructions, Warnings, and Notes

Index of this chapter:

2.1 Safety Instructions
2.2 Warnings
2.3 Notes

2.1 Safety Instructions

Safety regulations require the following **during** a repair:

- Connect the set to the Mains (AC Power) via an isolation transformer (> 800 VA).
- Replace safety components, indicated by the symbol ⚠, only by components identical to the original ones. Any other component substitution (other than original type) may increase risk of fire or electrical shock hazard.

Safety regulations require that **after** a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the Mains (AC Power) lead for external damage.
- Check the strain relief of the Mains (AC Power) cord for proper function.
- Check the electrical DC resistance between the Mains (AC Power) plug and the secondary side (only for sets that have a Mains (AC Power) isolated power supply):
  1. Unplug the Mains (AC Power) cord and connect a wire between the two pins of the Mains (AC Power) plug.
  2. Set the Mains (AC Power) switch to the "on" position (keep the Mains (AC Power) cord unplugged!).
  3. Measure the resistance value between the pins of the Mains (AC Power) plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 Mohm and 12 Mohm.
  4. Switch "off" the set, and remove the wire between the two pins of the Mains (AC Power) plug.
- Check the cabinet for defects, to prevent touching of any inner parts by the customer.

2.2 Warnings

- All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD ⚠). Careless handling during repair can reduce life drastically. Make sure that, during repair, you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this same potential. Available ESD protection equipment:
  - Complete kit ESD3 (small tablemat, wristband, connection box, extension cable and earth cable) 4822 310 10671.
  - Wristband tester 4822 344 13999.
- Be careful during measurements in the high voltage section.
- Never replace modules or other components while the unit is switched "on".
- When you align the set, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.

2.3 Notes

2.3.1 General

- Measure the voltages and waveforms with regard to the chassis (= tuner) ground (⏚), or hot ground (⏚), depending on the tested area of circuitry. The voltages and waveforms shown in the diagrams are indicative. Measure them in the Service Default Mode (see chapter 5) with a colour bar signal and stereo sound (L: 3 kHz, R: 1 kHz unless stated otherwise) and picture carrier at 475.25 MHz for PAL, or 61.25 MHz for NTSC (channel 3).
- Where necessary, measure the waveforms and voltages with (╗╔) and without (╳) aerial signal. Measure the voltages in the power supply section both in normal operation (⏼) and in stand-by (⏻). These values are indicated by means of the appropriate symbols.
- The semiconductors indicated in the circuit diagram and in the parts lists, are interchangeable per position with the semiconductors in the unit, irrespective of the type indication on these semiconductors.

2.3.2 Schematic Notes

- All resistor values are in ohms, and the value multiplier is often used to indicate the decimal point location (e.g. 2K2 indicates 2.2 kohm).
- Resistor values with no multiplier may be indicated with either an "E" or an "R" (e.g. 220E or 220R indicates 220 ohm).
- All capacitor values are given in micro-farads ($\mu= x10^{-6}$), nano-farads ($n= x10^{-9}$), or pico-farads ($p= x10^{-12}$).
- Capacitor values may also use the value multiplier as the decimal point indication (e.g. 2p2 indicates 2.2 pF).
- An "asterisk" (*) indicates component usage varies. Refer to the diversity tables for the correct values.
- The correct component values are listed in the Spare Parts List. Therefore, always check this list when there is any doubt.

2.3.3 Rework on BGA (Ball Grid Array) ICs

General

Although (LF)BGA assembly yields are very high, there may still be a requirement for component rework. By rework, we mean the process of removing the component from the PWB and replacing it with a new component. If an (LF)BGA is removed from a PWB, the solder balls of the component are deformed drastically so the removed (LF)BGA has to be discarded.

Device Removal

As is the case with any component that, is being removed, it is essential when removing an (LF)BGA, that the board, tracks, solder lands, or surrounding components are not damaged. To remove an (LF)BGA, the board must be uniformly heated to a temperature close to the reflow soldering temperature.
A uniform temperature reduces the risk of warping the PWB. To do this, we recommend that the board is heated until it is certain that all the joints are molten. Then carefully pull the component off the board with a vacuum nozzle. For the appropriate temperature profiles, see the IC data sheet.

Area Preparation

When the component has been removed, the vacant IC area must be cleaned before replacing the (LF)BGA.
Removing an IC often leaves varying amounts of solder on the mounting lands. This excessive solder can be removed with either a solder sucker or solder wick. The remaining flux can be removed with a brush and cleaning agent.

After the board is properly cleaned and inspected, apply flux on the solder lands and on the connection balls of the (LF)BGA.
Note: Do not apply solder paste, as this has been shown to result in problems during re-soldering.

Device Replacement
The last step in the repair process is to solder the new component on the board. Ideally, the (LF)BGA should be aligned under a microscope or magnifying glass. If this is not possible, try to align the (LF)BGA with any board markers.
So as not to damage neighbouring components, it may be necessary to reduce some temperatures and times.

More Information
For more information on how to handle BGA devices, visit this URL: *www.atyourservice.ce.philips.com* (needs subscription, not available for all regions). After login, select "Magazine", then go to "Workshop Information". Here you will find Information on how to deal with BGA-ICs.

2.3.4 Lead-free Solder

Philips CE is producing lead-free sets (PBF) from 1.1.2005 onwards.

Identification: The bottom line of a type plate gives a 14-digit serial number. Digits 5 and 6 refer to the production year, digits 7 and 8 refer to production week (in example below it is 1991 week 18).

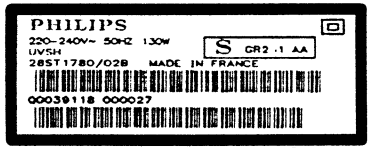

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Figure 2-1 Serial number example

Regardless of the special lead-free logo (which is not always indicated), one must treat all sets from this date onwards according to the rules as described below.

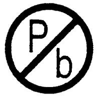

Figure 2-2 Lead-free logo

Due to lead-free technology some rules have to be respected by the workshop during a repair:

- Use only lead-free soldering tin Philips SAC305 with order code 0622 149 00106. If lead-free solder paste is required, please contact the manufacturer of your soldering equipment. In general, use of solder paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free soldering tin. The solder tool must be able:
  - To reach a solder-tip temperature of at least 400°C.
  - To stabilise the adjusted temperature at the solder-tip.
  - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature of around 360°C - 380°C is reached and stabilised at the solder joint. Heating time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C, otherwise wear-out of tips will increase drastically and flux-fluid will be destroyed. To avoid wear-out of tips, switch "off" unused equipment or reduce heat.
- Mix of lead-free soldering tin/parts with leaded soldering tin/parts is possible but PHILIPS recommends strongly to avoid mixed regimes. If this cannot be avoided, carefully clear the solder-joint from old tin and re-solder with new tin.
- Use only original spare-parts listed in the Service-Manuals. Not listed standard material (commodities) has to be purchased at external companies.
- Special information for lead-free BGA ICs: these ICs will be delivered in so-called "dry-packaging" to protect the IC against moisture. This packaging may only be opened shortly before it is used (soldered). Otherwise the body of the IC gets "wet" inside and during the heating time the structure of the IC will be destroyed due to high (steam-) pressure inside the body. If the packaging was opened before usage, the IC has to be heated up for some hours (around 90°C) for drying (think of ESD-protection!).
  Do not re-use BGAs at all!
- For sets produced before 1.1.2005, containing leaded soldering tin and components, all needed spare parts will be available till the end of the service period. For the repair of such sets nothing changes.

In case of doubt whether the board is lead-free or not (or with mixed technologies), you can use the following method:

- Always use the highest temperature to solder, when using SAC305 (see also instructions below).
- De-solder thoroughly (clean solder joints to avoid the mixing of two alloys).

Caution: For BGA-ICs, you **must** use the correct temperature profile, which is coupled to the 12NC. For an overview of these profiles, visit the website *www.atyourservice.ce.philips.com* (needs subscription, but is not available for all regions).
You will find this and more technical information within the "Magazine", chapter "Workshop information".
For additional questions please contact your local repair help desk.

2.3.5 Practical Service Precautions

- **It makes sense to avoid exposure to electrical shock.** While some sources are expected to have a possible dangerous impact, others of quite high potential are of limited current and are sometimes held in less regard.
- **Always respect voltages.** While some may not be dangerous in themselves, they can cause unexpected reactions that are best avoided. Before reaching into a powered TV set, it is best to test the high voltage insulation. It is easy to do, and is a good service precaution.

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3. Directions for Use

You can download this information from the following websites:
http://www.philips.com/support
http://www.p4c.philips.com

4. Mechanical Instructions

Index of this chapter:
4.1 Cable Dressing
4.2 Service Position
4.3 Assy/Panel Removal
4.4 Set Re-assembly

Notes:
- Figures below can deviate slightly from the actual situation, due to the different set executions.
- Follow the disassembling instructions in described order.

4.1 Cable Dressing

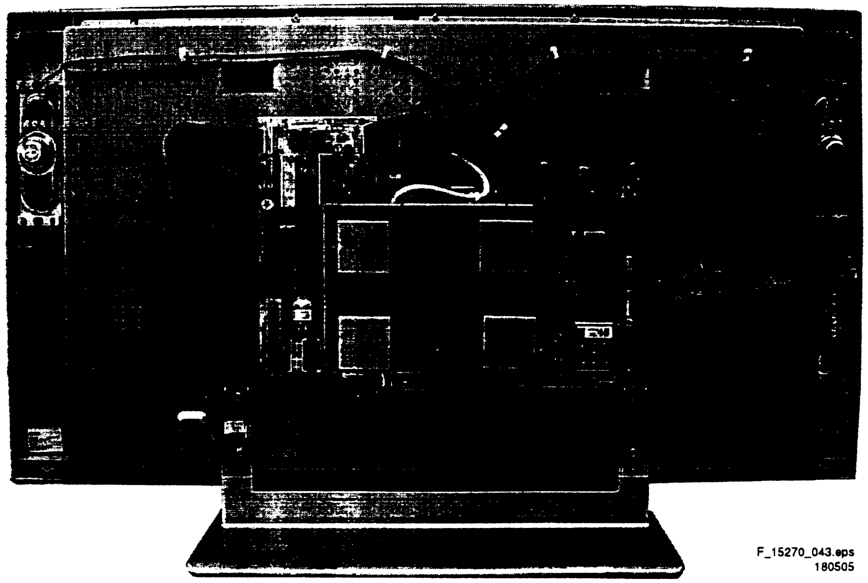

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Figure 4-1 Cable dressing

4.2 Service Position

First, put the TV set in its service position. Therefore, place it upside down on a table top (use a protection sheet or foam bars).

4.2.1 The Foam Bars

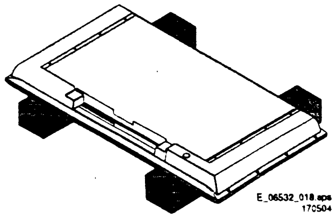

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Figure 4-2 Foam bars

The foam bars (order code 3122 785 90580) can be used for all types and sizes of Flat TVs. By laying the plasma or LCD TV flat on the (ESD protective) foam bars, a stable situation is created to perform measurements and alignments. By first placing a mirror flat on the table under the TV you can easily see if something is happening on the screen.

4.3 Assy/Panel Removal

4.3.1 Rear Cover

Warning: Disconnect the mains power cord before you remove the rear cover.

1. Remove the screws that secure the rear cover.
2. Lift the rear cover from the cabinet cautiously. Make sure that wires and other internal components are not damaged during cover removal.

4.3.2 Side I/O Panel

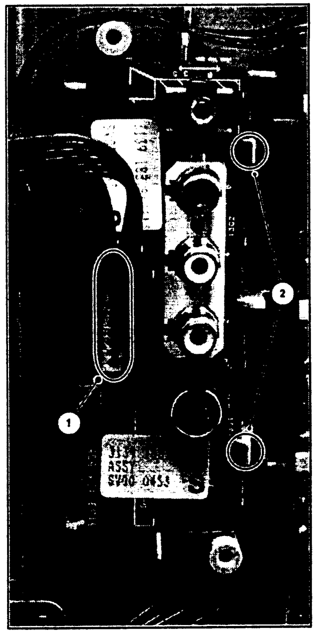

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Figure 4-3 Side I/O panel

1. Disconnect the cable (1) from the panel.
2. Release the two fixation clamps (2) and lift the panel out of the bracket.

4.3.3 LED Panel

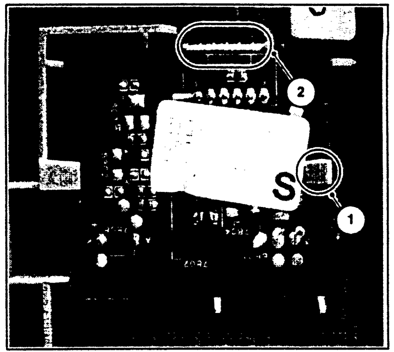

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Figure 4-4 LED panel

1. Release the fixation clamp (1) and take the panel out of the bracket.
2. Disconnect the cable (2) from the panel.

4.3.4 Keyboard Control Panel

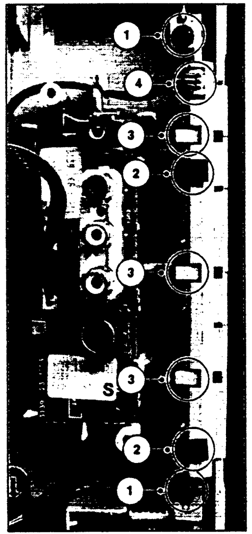

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Figure 4-5 Keyboard control panel

1. Remove the two fixation screws (1) from the bracket and take out the panel/bracket combination.
2. Remove the fixation tape (2) from the panel/bracket combination.
3. Release the three fixation clamps (3) and lift the panel out of the bracket.
4. Disconnect the cable (4) from the panel.

4.3.5 *SSB Board Cover Shield (depending on model)*

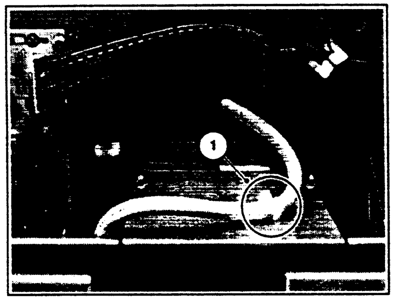

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Figure 4-6 Cable clip on cover shield

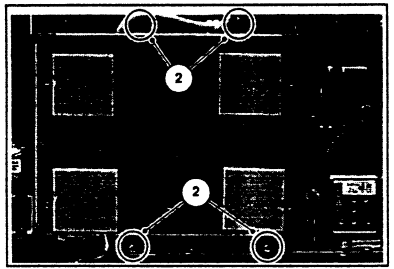

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Figure 4-7 SSB board cover shield

1. Release the cable from the plastic cable clip (1) on the shield (see Figure "Cable clip on cover shield" above).
2. Remove the four fixation screws (2, see Figure "SSB board cover shield"; the screws are also indicated by arrows on the shield) and remove the shield.
   Notice that on one side, the shield is not only held by two screws, but also by two brackets (see Figure "Cable clip on cover shield" above).

4.3.6 SSB Board

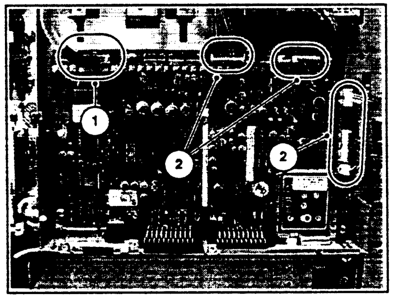

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Figure 4-8 SSB board connectors

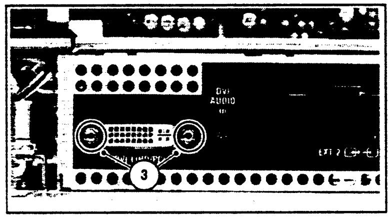

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Figure 4-9 DVI-I connector screws

1. Very **cautiously** disconnect the LVDS cable (1) from the panel (see Figure "SSB board connectors"). Notice that this cable is very fragile.
2. Disconnect the six remaining cables (2) from the panel.
3. Remove the fixation screws that secure the SSB board (depending on model) and also the two fixation screws (3) from the DVI-I connector on the SSB board (see Figure "DVI-I connector screws").
4. Take the panel out of its brackets.

4.3.7 Power Supply Panel (various models used)

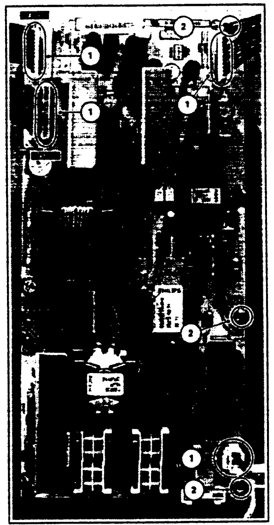

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Figure 4-10 Power supply panel

1. Disconnect all cables (1) from the panel.
   Notice that the two connectors for X520 and X530 on this panel are similar, and should not be mixed up later when they are reconnected (X520 is connected via its flatcable to connector CN01 on the LCD panel, near the R-speaker; X530 is connected via its flatcable to connector CN04 on the LCD panel, near the L-speaker).
2. Remove the three fixation screws (2) from the panel.
3. Take the panel out of its brackets.

4.3.8 Audio Amplifier Panel

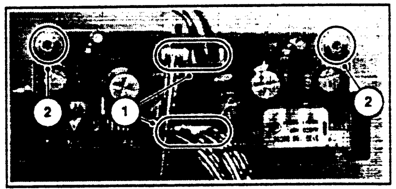

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Figure 4-11 Audio amplifier panel

1. Disconnect all cables (1) from the panel.
2. Remove the fixation screws (2) from the panel.
3. Remove the panel.

4.3.9 LCD Panel

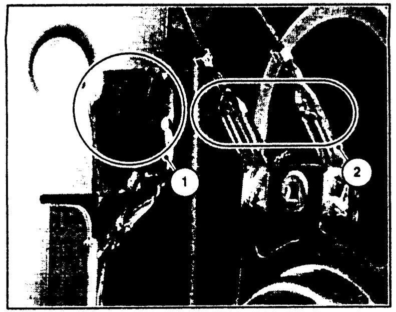

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Figure 4-12 Anti-static copper foil

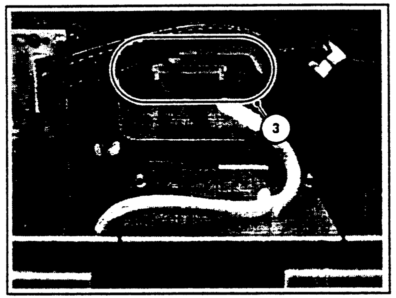

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Figure 4-13 LVDS connector

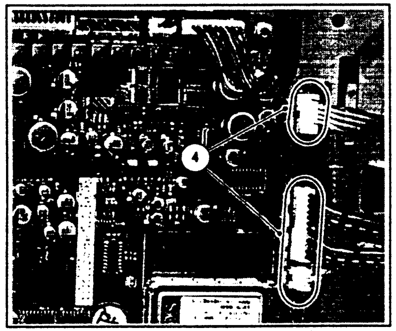

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Figure 4-14 SSB board connectors for side I/O, keyboard control, and LED

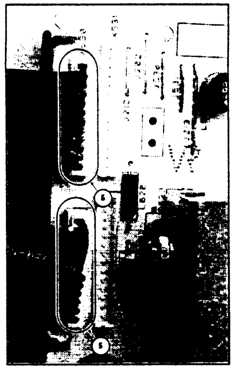

Figure 4-15 Connectors X520 and X530 on power supply panel

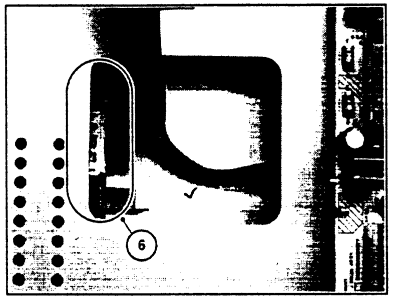

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Figure 4-16 Connector 66B on LCD panel

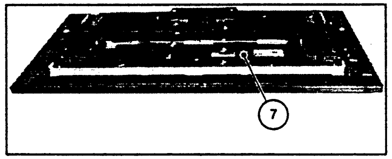

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Figure 4-17 LCD panel

To remove the LCD-panel, carry out the following steps:

1. Cautiously pull back the upper parts of the anti-static copper foils next to the "L" and "R" loudspeakers (see Figure "Anti-static copper foil"). Do this in such a way that the foils are no longer attached to the metal ground plate on which the SSB board is mounted.
2. Disconnect the cables (2) from the "L" and the "R" loudspeakers (see Figure "Anti-static copper foil").
3. **Important:** Unplug the LVDS connector (3) on the LCD panel (see Figure "LVDS connector").
   Be careful, as this is a very fragile connector!
4. Unplug the connectors (4) of the Side I/O panel, the Top Control panel, and the LED panel on the SSB board (see Figure "SSB board connectors for side I/O, keyboard control, and LED").
5. Unplug the X520 and X530 connectors (5) on the Power Supply board (see Figure " Connectors X520 and X530 on power supply panel"). Instead of X520, also connector 66B (6) on the other end of the flatcable can be unplugged (see Figure "Connector 66B on LCD panel").
6. Lift the metal frame (together with all PWBs) from the LCD panel.
   Take care not to damage the fragile LVDS cable, the 66B connector and the anti-static copper foils near the "L" and "R" loudspeakers (take care of this too when later re-assembling the TV set and replacing the copper foil).
7. After removal of the metal frame, you can lift the LCD display (7) from its plastic frame (see Figure "LCD panel").
8. If the plastic frame is damaged, replace it by a new frame, after removing the loudspeakers, the Side I/O panel, the Top Control panel, and the LED panel.

4.4 Set Re-assembly

To re-assemble the whole set, execute all processes in reverse order.

Notes:

- While re-assembling, make sure that all cables are placed and connected in their original positions. See Figure "Cable dressing". Also make sure that the anti-static copper foils are not damaged and that they make good electrical contact with the metal frame. Be careful with the fragile LVDS cable.

5. Service Modes, Error Codes, and Fault Finding

Index of this chapter:

5.1 Test Points
5.2 Service Modes
5.3 Problems and Solving Tips Related to CSM
5.4 ComPair
5.5 Error Codes
5.6 The Blinking LED Procedure
5.7 Fault Finding and Repair Tips

5.1 Test Points

This chassis is equipped with test points in the service printing. In the schematics test points are identified with a rectangle box around Fxxx or Ixxx.
Perform measurements under the following conditions:

- Television set in Service Default Alignment Mode.
- Video input: Colour bar signal.
- Audio input: 3 kHz left channel, 1 kHz right channel.

5.2 Service Modes

Service Default mode (SDM) and Service Alignment Mode (SAM) offers several features for the service technician, while the Customer Service Mode (CSM) is used for communication between the call centre and the customer.

This chassis also offers the option of using ComPair, a hardware interface between a computer and the TV chassis. It offers the possibilities of structured troubleshooting, error code reading, and software version readout for all chassis. *Minimum requirements for ComPair:* a Pentium processor, a Windows OS, and a CD-ROM drive (see also paragraph "ComPair").

5.2.1 Service Default Mode (SDM)

Purpose

- To create a predefined setting for measurements to be made.
- To override software protections.
- To start the blinking LED procedure.
- To inspect the error buffer.
- To check the life timer.

Specifications

- Tuning frequency: 475.25 MHz.
- Colour system: PAL-BG.
- All picture settings at 50% (brightness, colour contrast, hue).
- Bass, treble, and balance at 50 %; volume at 25 %.
- All service-unfriendly modes (if present) are disabled. The service unfriendly modes are:
  - Timer / Sleep timer.
  - Child / parental lock.
  - Blue mute.
  - Hotel / hospital mode.
  - Auto shut off (when no "IDENT" video signal is received for 15 minutes).
  - Skipping of non-favourite presets / channels.
  - Auto-storage of personal presets.
  - Auto user menu time-out.
  - Auto Volume Levelling (AVL).

How to Enter
To enter SDM, use one of the following methods:

- Press the following key sequence on the remote control transmitter: "062596" directly followed by the MENU button (do not allow the display to time out between entries while keying the sequence).
- Short "Service" jumpers on the TV board during cold start and apply mains (see Figure "Service jumpers"). Then press the mains button (remove the short after start-up). **Caution:** Entering SDM by shorting "Service" jumpers will override the +8V-protection. Do this only for a short period. When doing this, the service-technician must know exactly what he is doing, as it could damage the television set.
- Or via ComPair.

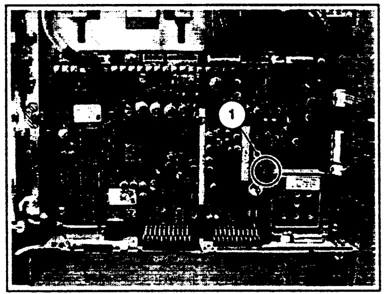

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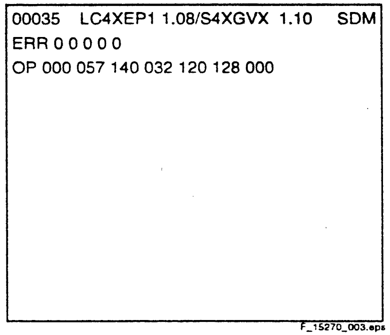
Figure 5-1 Service jumpers

After entering SDM, the following screen is visible, with SDM in the upper right corner of the screen to indicate that the television is in Service Default Mode.



```
00035  LC4XEP1 1.08/S4XGVX  1.10     SDM
ERR 0 0 0 0 0
OP 000 057 140 032 120 128 000
```

F_15270_003.eps
1250505

Figure 5-2 SDM menu

How to Navigate
Use one of the following methods:

- When you press the MENU button on the remote control, the set will switch on the normal user menu in the SDM mode.
- On the TV, press and hold the VOLUME DOWN and press the CHANNEL DOWN for a few seconds, to switch from SDM to SAM and reverse.

How to Exit
Switch the set to STANDBY by pressing the mains button on the remote control transmitter or the television set.
If you turn the television set off by removing the mains (i.e., unplugging the television) without using the mains button, the television set will remain in SDM when mains is re-applied, and the error buffer is not cleared.

5.2.2 Service Alignment Mode (SAM)

Purpose

- To change option settings.
- To display / clear the error code buffer.
- To perform alignments.

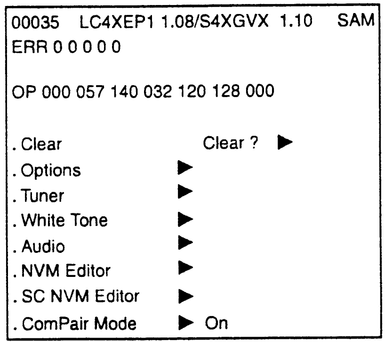
Specifications

- Operation hours counter (maximum five digits displayed).
- Software version, Error codes, and Option settings display.
- Error buffer clearing.
- Option settings.
- AKB switching.
- Software alignments (Tuner, White Tone, Geometry & Audio).
- NVM Editor.
- ComPair Mode switching.

How to Enter
To enter SAM, use one of the following methods:

- Press the following key sequence on the remote control transmitter: "062596" directly followed by the OSD/STATUS/INFO(I+) button (do not allow the display to time out between entries while keying the sequence).
- Or via ComPair.

After entering SAM, the following screen is visible, with SAM in the upper right corner of the screen to indicate that the television is in Service Alignment Mode.



```
00035  LC4XEP1 1.08/S4XGVX  1.10     SAM
ERR 0 0 0 0 0

OP 000 057 140 032 120 128 000

. Clear                Clear ?  ►
. Options            ►
. Tuner              ►
. White Tone         ►
. Audio              ►
. NVM Editor         ►
. SC NVM Editor      ►
. ComPair Mode       ►  On
```

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Figure 5-3 SAM menu

Menu Explanation

1. **LLLLL.** This represents the run timer. The run timer counts normal operation hours, but does not count standby hours.
2. **AAABCD-X.Y.** This is the software identification of the main microprocessor:
   - **A**= the project name (LC04.x).
   - **B**= the region: E= Europe, A= Asia Pacific, U= NAFTA, L= LATAM.
   - **C**= the software diversity:
     - **Europe:** T= 1 page TXT, F= Full TXT, V= Voice control.
     - **LATAM and NAFTA:** N= Stereo non-dBx, S= Stereo dBx.
     - **Asian Pacific:** T= TXT, N= non-TXT, C= NTSC.
     - **ALL regions:** M= mono, D= DVD, Q= Mk2.
   - **D**= the language cluster number.
   - **X**= the main software version number (updated with a major change that is incompatible with previous versions).
   - **Y**= the sub software version number (updated with a minor change that is compatible with previous versions).
3. **EEEEE-F.GG.** This is the software identification of the Scaler:
   - **EEEEEE**= the scaler sw cluster
   - **F**= the main sw version no.
   - **GG**= the sub-version no.
4. **SAM.** Indication of the Service Alignment Mode.
5. **Error Buffer.** Shows all errors detected since the last time the buffer was erased. Five errors possible.
6. **Option Bytes.** Used to set the option bytes. See "Options" in the Alignments section for a detailed description. Seven codes are possible.
7. **Clear.** Erases the contents of the error buffer. Select the CLEAR menu item and press the MENU RIGHT key. The content of the error buffer is cleared.
8. **Options.** Used to set the option bits. See "Options" in the Alignments section for a detailed description.
9. **Tuner.** Used to align the tuner. See "Tuner" in the Alignments section for a detailed description.
10. **White Tone.** Used to align the white tone. See "White Tone" in the Alignments section for a detailed description.
11. **Audio.** No audio alignment is necessary for this television set.
12. **NVM Editor.** Can be used to change the NVM data in the television set. See table "NVM data" further on.
13. **SC NVM Editor.** Can be used to edit Scaler NVM.
14. **ComPair.** Can be used to switch on the television to In System Programming (ISP) mode, for software uploading via ComPair.
    Caution: When this mode is selected without ComPair connected, the TV will be blocked. Remove the AC power to reset the TV.

How to Navigate

- In SAM, select menu items with the MENU UP/DOWN keys on the remote control transmitter. The selected item will be highlighted. When not all menu items fit on the screen, use the MENU UP/DOWN keys to display the next / previous menu items.
- With the MENU LEFT/RIGHT keys, it is possible to:
  - Activate the selected menu item.
  - Change the value of the selected menu item.
  - Activate the selected submenu.
- In SAM, when you press the MENU button twice, the set will switch to the normal user menus (with the SAM mode still active in the background). To return to the SAM menu press the MENU or STATUS/EXIT button.
- When you press the MENU key in while in a submenu, you will return to the previous menu.

How to Store SAM Settings

To store the settings changed in SAM mode, leave the top level SAM menu by using the POWER button on the remote control transmitter or the television set.

How to Exit

Switch the set to STANDBY by pressing the mains button on the remote control transmitter or the television set.
If you turn the television set "off" by removing the mains (i.e., unplugging the television) without using the mains button, the television set will remain in SAM when mains is re-applied, and the error buffer is not cleared.

5.2.3 Customer Service Mode (CSM)

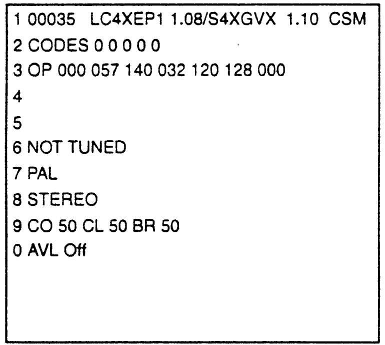
Purpose

The Customer Service Mode shows error codes and information on the TV's operation settings. The call centre can instruct the customer (by telephone) to enter CSM in order to identify the status of the set. This helps the call centre to diagnose problems and failures in the TV set before making a service call.
The CSM is a read-only mode; therefore, modifications are not possible in this mode.

How to Enter

To enter CSM, press the following key sequence on the remote control transmitter: **"123654"** (do not allow the display to time out between entries while keying the sequence).

Upon entering the Customer Service Mode, the following screen will appear:



```
1 00035  LC4XEP1 1.08/S4XGVX  1.10  CSM
2 CODES 0 0 0 0 0
3 OP 000 057 140 032 120 128 000
4
5
6 NOT TUNED
7 PAL
8 STEREO
9 CO 50 CL 50 BR 50
0 AVL Off
```

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120505

Figure 5-4 CSM menu

Menu Explanation

1. Indication of the decimal value of the operation hours counter, Software identification of the main microprocessor (see "Service Default or Alignment Mode" for an explanation), and the service mode (CSM = Customer Service Mode).
2. Displays the last five errors detected in the error code buffer.
3. Displays the option bytes.
4. Displays the type number version of the set.
5. Reserved item for P3C call centres (AKBS stands for Advanced Knowledge Base System).
6. Indicates the television is receiving an "IDENT" signal on the selected source. If no "IDENT" signal is detected, the display will read "NOT TUNED"
7. Displays the detected Colour system (e.g. PAL/NTSC).
8. Displays the detected Audio (e.g. stereo/mono).
9. Displays the picture setting information.
10. Displays the sound setting information.

How to Exit

To exit CSM, use one of the following methods:

- Press the MENU, STATUS/EXIT, or POWER button on the remote control transmitter.
- Press the POWER button on the television set.

5.3 Problems and Solving Tips Related to CSM

5.3.1 Picture Problems

Note: The problems described below are all related to the TV settings. The procedures used to change the value (or status) of the different settings are described.

Picture too Dark or too Bright

If:

- The picture improves when you press the AUTO PICTURE button on the remote control transmitter, or
- The picture improves when you enter the Customer Service Mode,

Then:

1. Press the AUTO PICTURE button on the remote control transmitter repeatedly (if necessary) to choose PERSONAL picture mode.
2. Press the MENU button on the remote control transmitter. This brings up the normal user menu.
3. In the normal user menu, use the MENU UP/DOWN keys to highlight the PICTURE sub menu.
4. Press the MENU LEFT/RIGHT keys to enter the PICTURE sub menu.
5. Use the MENU UP/DOWN keys (if necessary) to select BRIGHTNESS.
6. Press the MENU LEFT/RIGHT keys to increase or decrease the BRIGHTNESS value.
7. Use the MENU UP/DOWN keys to select PICTURE.
8. Press the MENU LEFT/RIGHT keys to increase or decrease the PICTURE value.
9. Press the MENU button on the remote control transmitter twice to exit the user menu.
10. The new PERSONAL preference values are automatically stored.

White Line around Picture Elements and Text

If:

The picture improves after you have pressed the AUTO PICTURE button on the remote control transmitter,

Then:

1. Press the AUTO PICTURE button on the remote control transmitter repeatedly (if necessary) to choose PERSONAL picture mode.
2. Press the MENU button on the remote control transmitter. This brings up the normal user menu.
3. In the normal user menu, use the MENU UP/DOWN keys to highlight the PICTURE sub menu.
4. Press the MENU LEFT/RIGHT keys to enter the PICTURE sub menu.
5. Use the MENU UP/DOWN keys to select SHARPNESS.
6. Press the MENU LEFT key to decrease the SHARPNESS value.
7. Press the MENU button on the remote control transmitter twice to exit the user menu.
8. The new PERSONAL preference value is automatically stored.

Snowy Picture

Check CSM line 6. If this line reads "Not Tuned", check the following:

- Antenna not connected. Connect the antenna.
- No antenna signal or bad antenna signal. Connect a proper antenna signal.
- The tuner is faulty (in this case line 2, the Error Buffer line, will contain error number 10). Check the tuner and replace/repair the tuner if necessary.

Black and White Picture

If:

- The picture improves after you have pressed the AUTO PICTURE button on the remote control transmitter,

Then:

1. Press the AUTO PICTURE button on the remote control transmitter repeatedly (if necessary) to choose PERSONAL picture mode.
2. Press the MENU button on the remote control transmitter. This brings up the normal user menu.
3. In the normal user menu, use the MENU UP/DOWN keys to highlight the PICTURE sub menu.
4. Press the MENU LEFT/RIGHT keys to enter the PICTURE sub menu.
5. Use the MENU UP/DOWN keys to select COLOR.
6. Press the MENU RIGHT key to increase the COLOR value.
7. Press the MENU button on the remote control transmitter twice to exit the user menu.
8. The new PERSONAL preference value is automatically stored.

Menu Text not Sharp Enough

If:

- The picture improves after you have pressed the AUTO PICTURE button on the remote control transmitter,

Then:

1. Press the AUTO PICTURE button on the remote control transmitter repeatedly (if necessary) to choose PERSONAL picture mode.
2. Press the MENU button on the remote control transmitter. This brings up the normal user menu.
3. In the normal user menu, use the MENU UP/DOWN keys to highlight the PICTURE sub menu.
4. Press the MENU LEFT/RIGHT keys to enter the PICTURE sub menu.
5. Use the MENU UP/DOWN keys to select PICTURE.
6. Press the MENU LEFT key to decrease the PICTURE value.
7. Press the MENU button on the remote control transmitter twice to exit the user menu.
8. The new PERSONAL preference value is automatically stored.

5.4 ComPair

5.4.1 Introduction

ComPair (Computer Aided Repair) is a service tool for Philips Consumer Electronics products. ComPair is a further development on the European DST (service remote control), which allows faster and more accurate diagnostics. ComPair has three big advantages:

- ComPair helps you to quickly get an understanding on how to repair the chassis in a short time by guiding you systematically through the repair procedures.
- ComPair allows very detailed diagnostics (on I^2C level) and is therefore capable of accurately indicating problem areas. You do not have to know anything about I^2C commands yourself because ComPair takes care of this.
- ComPair speeds up the repair time since it can automatically communicate with the chassis (when the microprocessor is working) and all repair information is directly available. When ComPair is installed together with the Force/SearchMan electronic manual of the defective chassis, schematics and PWBs are only a mouse click away.

5.4.2 Specifications

ComPair consists of a Windows based fault finding program and an interface box between PC and the (defective) product. The ComPair interface box is connected to the PC via a serial (or RS-232) cable.
For this chassis, the ComPair interface box and the TV communicate via a bi-directional service cable via the service connector(s).

The ComPair fault finding program is able to determine the problem of the defective television. ComPair can gather diagnostic information in two ways:

- Automatic (by communication with the television): ComPair can automatically read out the contents of the entire error buffer. Diagnosis is done on I^2C/UART level. ComPair can access the I^2C/UART bus of the television. ComPair can send and receive I^2C/UART commands to the micro controller of the television. In this way, it is possible for ComPair to communicate (read and write) to devices on the I^2C/UART buses of the TV-set.
- Manually (by asking questions to you): Automatic diagnosis is only possible if the micro controller of the television is working correctly and only to a certain extend. When this is not the case, ComPair will guide you through the fault finding tree by asking you questions (e.g. *Does the screen give a picture? Click on the correct answer: YES / NO*) and showing you examples (e.g. *Measure test-point I7 and click on the correct oscillogram you see on the oscilloscope*). You can answer by clicking on a link (e.g. text or a waveform picture) that will bring you to the next step in the fault finding process.

By a combination of automatic diagnostics and an interactive question / answer procedure, ComPair will enable you to find most problems in a fast and effective way.

5.4.3 How to Connect

This is described in the chassis fault finding database in ComPair.

CAUTION: It is compulsory to connect the TV to the PC as shown in the picture below (with the ComPair interface in between), as the ComPair interface acts as a level shifter. If one connects the TV directly to the PC (via UART), ICs will be blown!

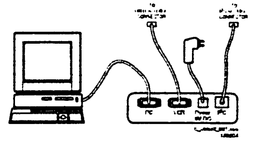


Figure 5-5 ComPair Interface connection

5.4.4 How to Order

ComPair order codes (EU/AP/LATAM):

- Starter kit ComPair32/SearchMan32 software and ComPair interface (excl. transformer): 3122 785 90450.
- ComPair interface (excl. transformer): 4822 727 21631.

- Starter kit ComPair32 software (registration version): 3122 785 60040.
- Starter kit SearchMan32 software: 3122 785 60050.
- ComPair32 CD (update): 3122 785 60070 (year 2002), 3122 785 60110 (year 2003 onwards).
- SearchMan32 CD (update): 3122 785 60080 (year 2002), 3122 785 60120 (year 2003), 3122 785 60130 (year 2004).
- ComPair firmware upgrade IC: 3122 785 90510.
- Transformer (non-UK): 4822 727 21632.
- Transformer UK: 4822 727 21633.
- ComPair interface cable: 3122 785 90004.
- ComPair interface extension cable: 3139 131 03791.
- ComPair UART interface cable: 3122 785 90630.

Note: If you encounter any problems, contact your local support desk.

5.5 Error Codes

The error code buffer contains all errors detected since the last time the buffer was erased. The buffer is written from left to right. When an error occurs that is not yet in the error code buffer, it is displayed at the left side and all other errors shift one position to the right.

5.5.1 How to Read the Error Buffer

You can read the error buffer in 3 ways:

- On screen via the SAM (if you have a picture).
  Examples:
  - ERROR: 0 0 0 0 0 : No errors detected
  - ERROR: 6 0 0 0 0 : Error code 6 is the last and only detected error
  - ERROR: 9 6 0 0 0 : Error code 6 was detected first and error code 9 is the last detected (newest) error
- Via the blinking LED procedure (when you have no picture). See "The Blinking LED Procedure".
- Via ComPair.

5.5.2 How to Clear the Error Buffer

The error code buffer is cleared in the following cases:

- By using the CLEAR command in the SAM menu:
  - To enter SAM, press the following key sequence on the remote control transmitter: "062596" directly followed by the OSD/STATUS button (do not allow the display to time out between entries while keying the sequence).
  - Make sure the menu item CLEAR is highlighted. Use the MENU UP/DOWN buttons, if necessary.
  - Press the MENU RIGHT button to clear the error buffer. The text on the right side of the "CLEAR" line will change from "CLEAR?" to "CLEARED"
- If the contents of the error buffer have not changed for 50 hours, the error buffer resets automatically.

Note: If you exit SAM by disconnecting the mains from the television set, the error buffer is not reset.

5.5.3 Error Codes

In case of non-intermittent faults, write down the errors present in the error buffer and clear the error buffer before you begin the repair. This ensures that old error codes are no longer present.
If possible, check the entire contents of the error buffer. In some situations, an error code is only the result of another error and not the actual cause of the problem (for example, a fault in the protection detection circuitry can also lead to a protection).

Table 5-1 Error code overview

Error	Device	Error Description	Check Item	Diagram
0	Not applicable	No Error		
1	Not applicable	Mis-match of TV Hercules SW and Scaler SW	-	-
2	Not applicable	-	-	-
3	Not applicable	-	-	-
4	Genesis Scaler Flash-ROM	I^2C error while communicating with the Genesis Scaler and/or Flash-ROM is faulty/empty	7801 7B01	B7 + B8 B10
5	Scaler supply 7752	+5V protection	7752	B6
6	Not applicable	General I^2C error	1102, 7L04, 7M00	B1 + B18 + B19
7	ADC	I^2C error	7L04	B18
8	Scaler EEPROM	I^2C error while communicating with the Scaler EEPROM	7C01	B11
9	Hercules EEPROM	I^2C error while communicating with the Hercules EEPROM (NVM for TV). **Remark**: when the Hercules EEPROM is defective, the Hercules should operate with its default values.	7207	B2
10	Tuner	I^2C error while communicating with the PLL tuner	1102, F102, F104, F107	B1
11	Columbus	I^2C error while communicating with the 2D/3D combfilter Columbus	7M00	B19
12	Not applicable	-	-	-
13	HDMI Panellink Receiver/ Decoder	I^2C error while communicating with the iBoard HDMI Panellink Receiver/ Decoder (only in NAFTA and AP sets)	7D03	B12 (only in NAFTA and AP sets)
14	Scaler SDRAM	Read-write error with the Scaler SDRAM	7B01	B10
15	Not applicable	-	-	-
16	EPLD	I^2C error while communicating with EPLD	7N02	B20 + B21
17	Digital Module (only on Digital sets)	I^2C error while communicating with the Digital Module (only on Digital sets)	Digital Module (only on Digital sets)	
18	Not applicable	-	-	-

5.6 The Blinking LED Procedure

Using this procedure, you can make the contents of the error buffer visible via the front LED. This is especially useful when there is no picture.

When the SDM is entered, the front LED will blink the contents of the error-buffer:

- The LED blinks with as many pulses as the error code number, followed by a time period of 1.5 seconds, in which the LED is off.
- Then this sequence is repeated.

Any RC5 command terminates this sequence.

Example of error buffer: **12 9 6 0 0**
After entering SDM, the following occurs:

- 1 long blink of 5 seconds to start the sequence,
- 12 short blinks followed by a pause of 1.5 seconds,
- 9 short blinks followed by a pause of 1.5 seconds,
- 6 short blinks followed by a pause of 1.5 seconds,
- 1 long blink of 1.5 seconds to finish the sequence,
- The sequence starts again with 12 short blinks.

5.7 Fault Finding and Repair Tips

Notes:

- It is assumed that the components are mounted correctly with correct values and no bad solder joints.
- Before any fault finding actions, check if the correct options are set.

5.7.1 NVM Editor

In some cases, it can be handy if one directly can change the NVM contents. This can be done with the "NVM Editor" in SAM mode. With this option, single bytes can be changed.

Caution:

- **Do not change the NVM settings without understanding the function of each setting, because incorrect NVM settings may seriously hamper the correct functioning of the TV set!**
- **Do not change the Scaler NVM settings, as this will hamper the DVI functionality of the TV set!**
- Always note down the existing NVM settings, before changing the settings. This will enable you to return to the orgininal settings, if the new settings turn out to be incorrect.

Table 5-2 NVM editor overview

	Hex	Dec	Description
.ADR	0x000A	10	Existing value
.VAL	0x0000	0	New value
.Store	Store?		

Table 5-3 NVM Default values (option bit settings through NVM Editor in SAM Mode)

Byte Nr.	Bit	Feature/Mode	Description	32PF7320/10	32PF5320/10	26PF5320/10	26PF4310/10
Byte 0 174(dec)	0	QSS (LSB)	Mode of quasi split sound amplifier	1	1	1	1
	1	FMI	Connection of output of QSS amplifier	1	1	1	1
	2	HCO	EHT tracking mode	0	0	0	0
	3	HP2	Synchronization of OSD/Text display	1	1	1	1
	4	FSL	Forced slicing level for vertical sync	1	1	1	1
	5	TFR	DC transfer ratio of luminance signal	1	1	1	1
	6	OSVE	Black current measuring in overscan	0	0	0	0
	7	MVK (MSB)	(For Future Usage, as defined by software)	0	0	0	0
		Total Dec Values		59	59	59	59
		Total Hex Values		3B	3B	3B	3B
Byte 1 175(dec)	0	PSE	PSE	0	0	0	0
	1	OPC	OPC	0	0	0	0
	2	PRIS	PRIS	0	0	0	0
	3	CONTINUOUS FACTORY	Continuous factory mode	0	0	0	0
	4	WHITE PATTERN ON	Last color pattern status in factory mode	0	0	0	0
	5	SDM MODE	Service default mode on/off	0	0	0	0
	6	SAM MODE	Service Align mode on/off	0	0	0	0
	7	SVMA	Scavm On / Off	0	0	0	0
		Total Dec Values		0	0	0	0
		Total Hex Values		00	00	00	00
Byte 2 176(dec)	0	MUTE STATUS	Mute status	0	0	0	0
	1	TUNER AUTO MODE	Auto mode	1	1	1	1
	2	CABLE MODE	Cable/Antenna mode	0	0	0	0
	3	LAST POWER MODE	Last power status of the set	1	1	1	1
	4	CHILD LOCK MODE	Child lock enabled	0	0	0	0
	5	SURF MODE	Surf mode on/off	0	0	0	0
	6	FACTORY MODE	Factory mode on	0	0	0	0
	7	PSNS	For PAL color enhancement in ES4	1	1	1	1
		Total Dec Values		138	138	138	138
		Total Hex Values		8A	8A	8A	8A
Byte 3 177(dec)	0	RADIO/TV MODE	Radio mode or TV mode	0	0	0	0
	1	WAKE-UP MODE	WAKE-UP MODE	0	0	0	0
	2	HOTEL MODE	TV in Hotel mode	0	0	0	0
	3	HOTEL KBD LOCK	Keyboard locked	0	0	0	0
	4	HBL	HBL	0	0	0	0
	5	BLS	Blue stretch mode	1	1	1	1
	6	SL	SL	0	0	0	0
	7	CFA0	Comb filter On/Off	0	0	0	0
		Total Dec Values		32	32	32	32
		Total Hex Values		20	20	20	20
Byte 4 178(dec)	0	Signal Strength	Signal Strength Switch in MK2	0	0	0	0
	1	LPG	LPG	0	0	0	0
	2	DVD TRAY LOCK	Lock/Unlock DVD tray	0	0	0	0
	3	SCRSAVER MODE	Screen saver mode	1	1	1	1
	4	BKS	Black Stretch Mode	1	1	1	1
	5	BSD	Black Stretch Depth	1	1	1	0
	6	CRA0	Coring on SVM	1	1	1	1
	7	PIP QSS	PIP QSS	0	0	0	0
		Total Dec Values		120	120	120	88
		Total Hex Values		78	78	78	58
Byte 5 179(dec)	0	FFI	Fast Filter	0	0	0	0
	1	NNR	No red reduction during blue stretch	1	1	1	1
	2	MUS	NTSC matrix	1	1	1	1
	3	GAM	Gamma control	1	1	1	1
	4	CBS	Control sequence of beam current limiting	0	0	0	0
	5	LLB	Low level of beam current limiter	0	0	0	0
	6	DSA	Dynamic skin tone angle area	1	1	1	0
	7	DSK	Dynamic skin tone angle on/ off	0	0	0	1
		Total Dec Values		78	78	78	142
		Total Hex Values		4E	4E	4E	8E
Byte 6 180(dec)	0	LTI status	LTI last status	0	0	0	0
	1	Inc_Life_Time	Inc_Life_Time	0	0	0	0
	2	PC_Mode	PC_Mode	0	0	0	0
	3	HD_Mode	HD_Mode	0	0	0	0
	4	Tact_Switch	Tact_Switch	0	0	0	0
	5	Set_In_Special_Stby	Set_In_Special_Stby	0	0	0	0
	6	Hotel_OSDDisplay	Hotel_OSDDisplay	0	0	0	0
	7	Hotel_MonitorOut	Hotel_MonitorOut	0	0	0	0
		Total Dec Values		0	0	0	0
		Total Hex Values		00	00	00	00
Byte 7 181(dec)	0	Hotel_IconMode	Hotel_IconMode	0	0	0	0
	1	DBE	DBE	1	1	1	1
	2	SD	SD	0	0	0	0
	3	Set_in_PC_Sleep_Mode	Set_in_PC_Sleep_Mode	0	0	0	0
	4	Reserved	Reserved	0	0	0	0
	5	Reserved	Reserved	0	0	0	0
	6	Reserved	Reserved	0	0	0	0
	7	Reserved	Reserved	0	0	0	0
		Total Dec Values		2	2	2	2
		Total Hex Values		02	02	02	02

5.7.2 Load Default NVM Values

In case a blank NVM is placed or when the NVM content is corrupted, default values can be downloaded into the NVM. (For empty NVM replacement, short the SDM with a jumper and apply the mains voltage. Remember to remove the jumper after the reload is completed). After the default values are downloaded, it will be possible to start up and to start aligning the TV set. This is no longer initiated automatically; to initiate the download the following action has to be performed:

1. Switch "off" the TV set by disconnecting the AC Power plug.
2. Short circuit the SDM jumpers (keep short-circuited).
3. Press P+ or Ch+ on the local keyboard (and keep it pressed).
4. Switch on the TV set via the AC Power plug.
5. Keep pressing the P+/Ch+ button until the set has started up and the SDM is shown.

Alternative method:

1. Go to SAM.
2. Select NVM Editor (not SC NVM Editor).
3. Select ADR (address) to 1 (dec).
4. Change the VAL (value) to 170 (dec).
5. Store the value.
6. Disconnect the mains plug and wait for a few seconds.
7. Reconnect the mains plug and wait until the set goes into its standby mode (red LED lights up).
8. Restart the set.

5.7.3 Tuner and IF

No Picture in RF Mode, but there is a Noise Raster

1. Check whether picture is present in AV. If not, go to Video processing troubleshooting section.
2. If present, check if the Option settings are correct.
3. Check if all the supply voltages are present (3.3/5/8/12/33 V).
4. Check if the I^{2}C lines are working correctly (3.3 V).
5. Manually store a known channel and check if there is IF output at Tuner pin 11.
6. Check the tuning DC voltage at pin 2 of the Tuner. The DC voltage should vary according to the frequency/channel being chosen.
7. If the tuning voltage is OK, check the tuner output, pin 11.
8. If it has no output, the Tuner may have a defect. Change the Tuner.

Sound in Picture Problem for L' System (rolling horizontal lines)

1. Check whether AGC L' in SAM mode is set to 0.
2. If yes, align the set to correct value.

Required System is not Selected Correctly

Check whether a Service jumper (#4204 & 4205, 0805 size) is present. If yes, remove it.

5.7.4 Video Processing

No Power

1. Check +12 V and 3V3 at position 1J02.
2. If no supply, check the connector 1J02.
3. If it is correct, check the power supply board.

Power Supply Is Correct, but no Green LED

1. Check if the connectors 1K00 are properly inserted.
2. If they are inserted correctly, check if the 3V3 is present.

No Picture Display (blank screen with correct sound output)

1. Check whether the user menu is visible.
2. If the user menu is OK, activate teletext mode.
3. If teletext is OK, the problem is in the ADC (B18) & Columbus 3D combfilter (B19), if present (depending on model, see also paragraph "Teletext Path" in chapter 9).
4. If the user menu is not visible, check if the LCD panel backlight is ON.
5. If the backlight is OFF, the problem is in the power supply board or LCD panel. Also check pin 12 (LAMP_ON_OFF) of 1J02. It should be HIGH during normal operation.

Note: For faultfinding purposes, it is important to know the following: in Pixel Plus and Digital Crystal Clear models, which have an ADC (B18) and Columbus 3D combfilter (B19), the digital input of the scaler is used for the digital video path (Hercules output), whereas the analogue RGB input (analogue input of the scaler) is only used for teletext. This means that no mixed mode (video plus teletext simultaneously) is possible. If there is sound and teletext, but no video and user menu (blank screen), the digital path (Hercules - ADC - Columbus - Scaler) is faulty. If there is sound but no teletext, the back-end part (Scaler - LCD panel) is faulty. In Crystal Clear models, which do not have an ADC and Columbus, the RGB path (analogue input of scaler) is used for both video and teletext.

No TV, but PC is Present

1. Check if Hsync_SDTV and Vsync_SDTV are present at pin 1 & pin13 of 7E03.
2. If they are present, check teletext output.
3. If there is no teletext output, the IC TDA150xx may be defect.

5.7.5 Power Supply

Check Fuse

The power supply (various models are used) contains one fuse near the AC input connector X002.

1. Check with power supply in "off" state by means of ohmic measurement.
2. Fuse X102 may open in case of severe lightning strikes and/or failures in the power supply.
3. Check the standby signal at pin 10 of X200. ON is HIGH, OFF is LOW. During standby mode only the 3V3 is present at pin 10.

Protections Concept on Power Supply Board (two models)

1. **12 V output (pin 8 of X200):** Short-circuit protected by 2.5 A fuse X610. Over-voltage protection when output voltage is more than 40% above nominal value.
2. **Vaudio output (+18 or +24 V, depending on power supply model used); (pin 1 of X200):** Short-circuit proof (+18 V version has 2.5 A fuse X660). Over voltage protection when output voltage is more than 40% above nominal value.
3. **3V3STBY output (pin 3&4 of X200):** Short-circuit proof with auto-restart. Over voltage protection when output voltage is more than 40% above nominal value.
4. **24 V output (for Inverter X520 & X530):** Short-circuit proof with auto-restart. Over voltage protection when output voltage is more than 40% above nominal value.

Standby Mode

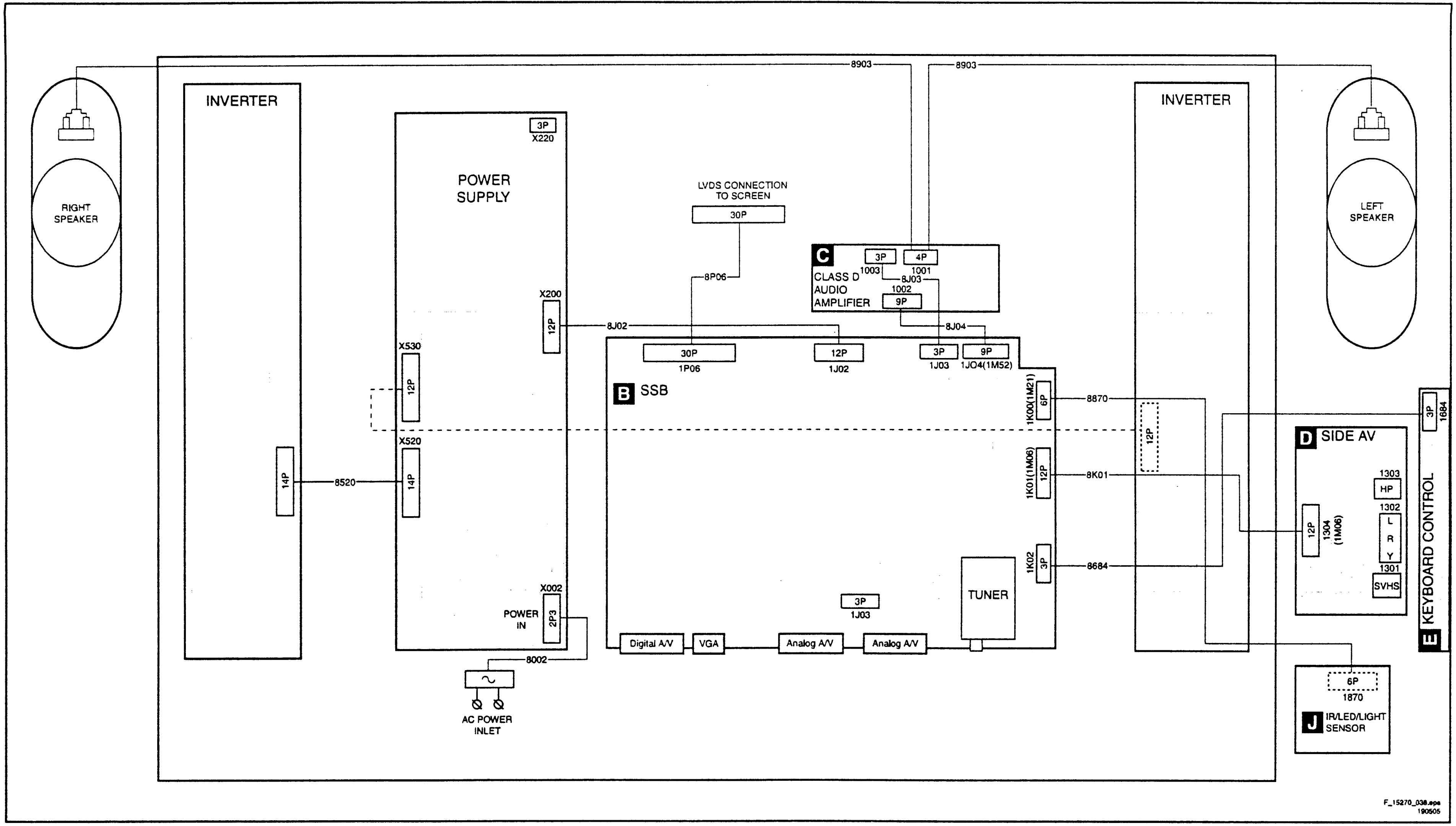
1. Apply a 12 ohm load resistor of sufficient power rating to all outputs mentioned above (+12 V, +18/ 24 V, +3V3 and +24 V). Connect the STBY pin (pin 10 of X200) to logical "L" (low), i.e. to GND.
2. Over an input voltage range of 90 V_{AC} to 276 V_{AC} only the +3V3 STBY output shall be up.

Normal Mode:

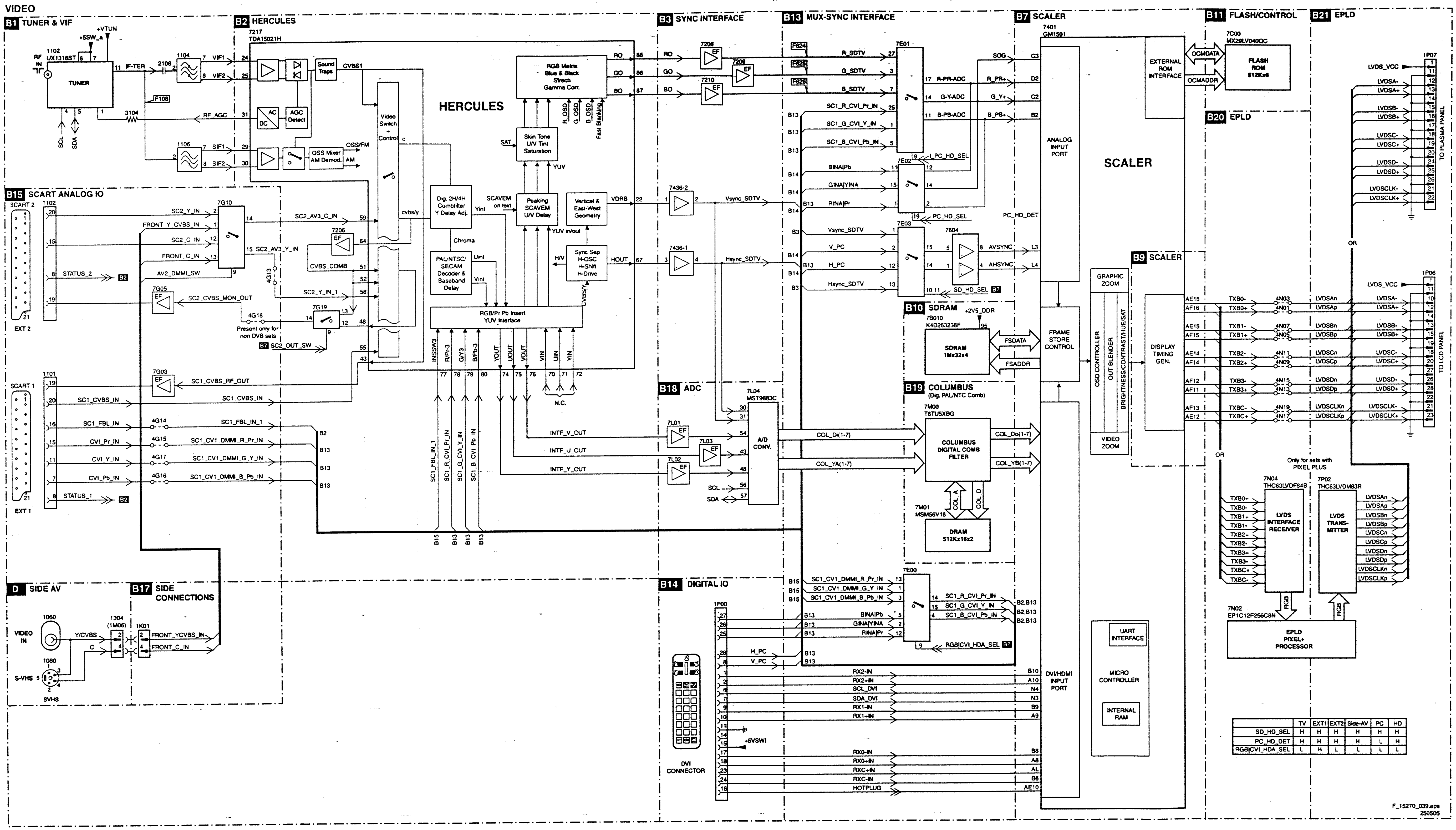
1. Apply a 12 ohm load resistor of sufficient power rating to all outputs mentioned above (+12 V, +18/ 24 V, +3V3 and +24 V). Connect the STBY pin (pin 10 of X200) to logical "H" (high), i.e. to the +3V3 STBY output via a 2,2 k pull up resistor.
2. Over an input voltage range of 90 V_{AC} to 276 V_{AC} all outputs shall be up. The voltage on the +3V3 STBY output shall be 3.3 V over the entire input voltage range. The voltage on the big 400 V capacitor on the power supply should also be 400 V ±10%.

6. Block Diagrams, Testpoint Overviews, and Waveforms

Wiring Diagram

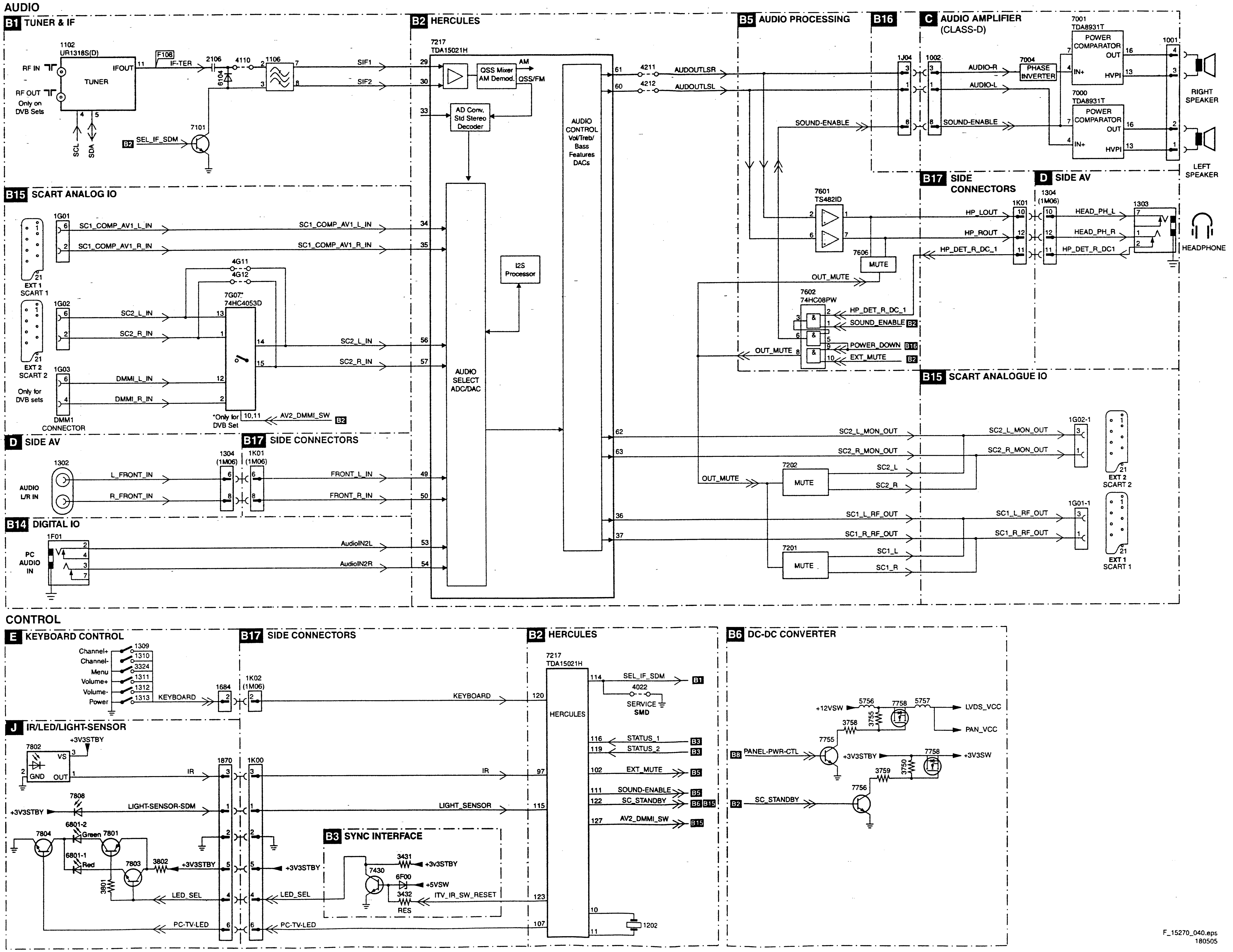

RIGHT SPEAKER
INVERTER
POWER SUPPLY
3P
X220
X200
12P
X530
12P
X520
14P
14P
8520
X002
POWER IN
2P3
8002
AC POWER INLET
8903
8903
LVDS CONNECTION TO SCREEN
30P
8P06
8J02
C
CLASS D AUDIO AMPLIFIER
3P
1003
4P
1001
8J03
1002
9P
8J04
B SSB
30P
1P06
12P
1J02
3P
1J03
9P
1JO4(1M52)
1K00(1M21)
6P
8870
1K01(1M06)
12P
8K01
1K02
3P
8684
TUNER
3P
1J03
Digital A/V
VGA
Analog A/V
Analog A/V
INVERTER
12P
LEFT SPEAKER
3P
1684
D SIDE AV
1303
HP
1302
L
R
Y
1301
SVHS
12P
1304 (1M06)
E KEYBOARD CONTROL
6P
1870
J IR/LED/LIGHT SENSOR
F_15270_038.eps
190505

Block Diagram Video


VIDEO
B1 TUNER & VIF
+VTUN
+5SW_a
RF IN
1102 UX1318ST
TUNER
IF-TER
2106
1104
VIF1
VIF2
3104
RF_AGC
SCL
SDA
1106
SIF1
SIF2
B2 HERCULES
7217 TDA15021H
Sound Traps
CVBS1
AC DC
AGC Detect
QSS Mixer AM Demod.
QSS/FM
AM
Video Switch + Control
HERCULES
RGB Matrix Blue & Black Strech Gamma Corr.
R_OSD
G_OSD
B_OSD
Fast Blanking
SAT
Skin Tone U/V Tint Saturation
YUV
Dig. 2H/4H Combfilter Y Delay Adj.
SCAVEM on text
Yint
Peaking SCAVEM U/V Delay
Vertical & East-West Geometry
VDRB
Chroma
PAL/NTSC/ SECAM Decoder & Baseband Delay
Uint
Vint
YUV in/out
H/V
Sync Sep H-OSC H-Shift H-Drive
HOUT
RGB/Pr Pb Insert YUV Interface
CVBS/Y
INSSW3
R/Pr-3
G/Y3
B/Pb-3
YOUT
UOUT
VOUT
YIN
UIN
VIN
N.C.
RO
GO
BO
B15 SCART ANALOG IO
SCART 2
1102
EXT 2
SC2_Y_IN
FRONT_Y_CVBS_IN
SC2_C_IN
FRONT_C_IN
7G10
SC2_AV3_C_IN
SC2_AV3_Y_IN
7206 EF
CVBS_COMB
STATUS_2
AV2_DMMI_SW
4G13
SC2_Y_IN_1
7G05 EF
SC2_CVBS_MON_OUT
4G18
Present only for non DVB sets
7G19
B7 SC2_OUT_SW
SCART 1
1101
EXT 1
7G03 EF
SC1_CVBS_RF_OUT
SC1_CVBS_IN
SC1_FBL_IN
4G14
SC1_FBL_IN_1
CVI_Pr_IN
4G15
SC1_CV1_DMMI_R_Pr_IN
CVI_Y_IN
4G17
SC1_CV1_DMMI_G_Y_IN
CVI_Pb_IN
4G16
SC1_CV1_DMMI_B_Pb_IN
STATUS_1
SC1_FBL_IN_1
SC1_G_CVI_Y_IN
SC1_R_CVI_Pr_IN
SC1_B_CVI_Pb_IN
INTF_V_OUT
INTF_U_OUT
INTF_Y_OUT
D SIDE AV
VIDEO IN
1060
Y/CVBS
C
S-VHS
SVHS
1304 (1M06)
B17 SIDE CONNECTIONS
1K01
FRONT_YCVBS_IN
FRONT_C_IN
B3 SYNC INTERFACE
7208 EF
7209 EF
7210 EF
7436-2
7436-1
Vsync_SDTV
Hsync_SDTV
B18 ADC
7L04 MST9883C
7L01 EF
7L03 EF
7L02 EF
A/D CONV.
SCL
SDA
B13 MUX-SYNC INTERFACE
F624
F625
F626
R_SDTV
G_SDTV
B_SDTV
7E01
SC1_R_CVI_Pr_IN
SC1_G_CVI_Y_IN
SC1_B_CVI_Pb_IN
R-PR-ADC
G-Y-ADC
B-PB-ADC
SOG
R_PR+
G_Y+
B_PB+
PC_HD_SEL
7E02
BINA|Pb
GINA|YINA
RINA|Pr
PC_HD_DET
7E03
7604
Vsync_SDTV
V_PC
H_PC
Hsync_SDTV
AVSYNC
AHSYNC
SD_HD_SEL
B10 SDRAM
+2V5_DDR
7B010 K4D263238F
SDRAM 1Mx32x4
FSDATA
FSADDR
B19 COLUMBUS
(Dig. PAL/NTC Comb)
7M00 T6TU5XBG
COL_Di(1-7)
COL_YA(1-7)
COLUMBUS DIGITAL COMB FILTER
COL_Do(1-7)
COL_YB(1-7)
COL A
COL D
7M01 MSM56V16
DRAM 512Kx16x2
B14 DIGITAL IO
1F00
DVI CONNECTOR
H_PC
V_PC
+5VSWI
7E00
SC1_CV1_DMMI_R_Pr_IN
SC1_CV1_DMMI_G_Y_IN
SC1_CV1_DMMI_B_Pb_IN
SC1_R_CVI_Pr_IN
SC1_G_CVI_Y_IN
SC1_B_CVI_Pb_IN
RGB|CVI_HDA_SEL
RX2-IN
RX2+IN
SCL_DVI
SDA_DVI
RX1-IN
RX1+IN
RX0-IN
RX0+IN
RXC+IN
RXC-IN
HOTPLUG
B7 SCALER
7401 GM1501
ANALOG INPUT PORT
SCALER
EXTERNAL ROM INTERFACE
OCMDATA
OCMADDR
FRAME STORE CONTROL
GRAPHIC ZOOM
OSD CONTROLLER
OUT BLENDER
BRIGHTNESS/CONTRAST/HUE/SAT
VIDEO ZOOM
DISPLAY TIMING GEN.
B9 SCALER
DVI/HDMI INPUT PORT
UART INTERFACE
MICRO CONTROLLER
INTERNAL RAM
B11 FLASH/CONTROL
7C00 MX29LV040QC
FLASH ROM 512Kx8
B20 EPLD
B21 EPLD
1P07
LVDS_VCC
LVDSA-
LVDSA+
LVDSB-
LVDSB+
LVDSC-
LVDSC+
LVDSD-
LVDSD+
LVDSCLK-
LVDSCLK+
TO PLASMA PANEL
OR
1P06
TO LCD PANEL
TXB0-
TXB0+
TXB1-
TXB1+
TXB2-
TXB2+
TXB3-
TXB3+
TXBC-
TXBC+
4N03
4N01
4N07
4N05
4N11
4N09
4N15
4N13
4N19
4N17
LVDSAn
LVDSAp
LVDSBn
LVDSBp
LVDSCn
LVDSCp
LVDSDn
LVDSDp
LVDSCLKn
LVDSCLKp
Only for sets with PIXEL PLUS
7N04 THC63LVDF84B
LVDS INTERFACE RECEIVER
7P02 THC63LVDM83R
LVDS TRANS-MITTER
7N02 EP1C12F256C8N
RGB
EPLD PIXEL+ PROCESSOR
F_15270_039.eps
250505

	TV	EXT1	EXT2	Side-AV	PC	HD
SD_HD_SEL	H	H	H	H	H	H
PC_HD_DET	H	H	H	H	L	H
RGB|CVI_HDA_SEL	L	H	L	L	L	L

Block Diagram Audio


AUDIO
B1 TUNER & IF
1102
UR1316S(D)
RF IN
RF OUT
Only on DVB Sets
TUNER
IFOUT
F106
IF-TER
2106
4110
1106
6104
SCL
SDA
7101
B2 SEL_IF_SDM
SIF1
SIF2
B2 HERCULES
7217
TDA15021H
QSS Mixer AM Demod.
AM
QSS/FM
AD Conv. Std Stereo Decoder
AUDIO CONTROL Vol/Treb/ Bass Features DACs
I2S Processor
AUDIO SELECT ADC/DAC
4211
4212
AUDOUTLSR
AUDOUTLSL
B5 AUDIO PROCESSING
B16
1J04
1002
C AUDIO AMPLIFIER (CLASS-D)
7001
TDA8931T
POWER COMPARATOR OUT
IN+
HVPI
7000
TDA8931T
7004
PHASE INVERTER
AUDIO-R
AUDIO-L
SOUND-ENABLE
1001
RIGHT SPEAKER
LEFT SPEAKER
7601
TS482ID
7606
MUTE
OUT_MUTE
7602
74HC08PW
HP_DET_R_DC_1
SOUND_ENABLE B2
POWER_DOWN B16
EXT_MUTE B2
B17 SIDE CONNECTORS
1K01
HP_LOUT
HP_ROUT
HP_DET_R_DC_1
D SIDE AV
1304 (1M06)
HEAD_PH_L
HEAD_PH_R
HP_DET_R_DC1
1303
HEADPHONE
B15 SCART ANALOG IO
1G01
SC1_COMP_AV1_L_IN
SC1_COMP_AV1_R_IN
EXT 1 SCART 1
1G02
SC2_L_IN
SC2_R_IN
EXT 2 SCART 2
4G11
4G12
7G07*
74HC4053D
1G03
DMMI_L_IN
DMMI_R_IN
Only for DVB sets
DMM1 CONNECTOR
*Only for DVB Set
AV2_DMMI_SW B2
D SIDE AV
1302
AUDIO L/R IN
L_FRONT_IN
R_FRONT_IN
B17 SIDE CONNECTORS
1304 (1M06)
1K01 (1M06)
FRONT_L_IN
FRONT_R_IN
B14 DIGITAL IO
1F01
PC AUDIO IN
AudioIN2L
AudioIN2R
B15 SCART ANALOGUE IO
SC2_L_MON_OUT
SC2_R_MON_OUT
7202
MUTE
SC2_L
SC2_R
1G02-1
EXT 2 SCART 2
SC1_L_RF_OUT
SC1_R_RF_OUT
7201
SC1_L
SC1_R
1G01-1
EXT 1 SCART 1
CONTROL
E KEYBOARD CONTROL
Channel+ 1309
Channel- 1310
Menu 3324
Volume+ 1311
Volume- 1312
Power 1313
KEYBOARD
1684
B17 SIDE CONNECTORS
1K02 (1M06)
B2 HERCULES
7217
TDA15021H
HERCULES
SEL_IF_SDM B1
4022
SERVICE SMD
STATUS_1 B3
STATUS_2 B3
EXT_MUTE B5
SOUND-ENABLE B5
SC_STANDBY B6 B15
AV2_DMMI_SW B15
1202
J IR/LED/LIGHT-SENSOR
7802
+3V3STBY
VS
GND
OUT
IR
7808
LIGHT-SENSOR-SDM
LIGHT_SENSOR
6801-2 Green
6801-1 Red
7804
7801
7803
3802
3801
LED_SEL
PC-TV-LED
1870
1K00
B3 SYNC INTERFACE
3431
7430
6F00
+5VSW
3432
RES
ITV_IR_SW_RESET
B6 DC-DC CONVERTER
+12VSW
5756
7758
5757
LVDS_VCC
PAN_VCC
3758
3755
7755
B8 PANEL-PWR-CTL
+3V3STBY
3750
+3V3SW
3759
7756
B2 SC_STANDBY

F_15270_040.eps
180505

Testpoint Overview Small Signal Board

F101	C1
F102	***D2***
F103	***C1***
F104	***D2***
F105	D1
F106	D2
F107	C1
F108	***C2***
F109	C2
F110	B2
F111	B2
F112	B2
F113	B2
F114	C2
F115	D2
F116	D2
F117	D2
F201	A2
F202	A2
F203	A2
F204	B3
F205	B2
F206	B2
F207	B2
F208	B2
F209	B2
F210	C2
F211	A2
F212	A2
F213	A2
F214	A2
F215	A2
F216	B3
F218	A2
F219	A2
F220	***A3***
F221	***A3***
F222	B2
F223	B2
F224	A2
F225	A3
F226	A3
F227	C3
F228	A3
F229	B2
F230	***A3***
F231	A2
F232	B3
F233	B3
F234	B3
F235	B3
F236	C3
F237	B2
F238	B2
F239	B2
F240	B2
F241	B3
F242	B2
F243	B2
F244	B2
F245	A2
F246	B2
F247	A2
F248	B2
F249	B2
F250	B3
F501	A2
F502	A2
F503	***A2***
F504	***A2***
F505	A3
F601	A1
F602	A2
F603	A1
F604	A2
F605	A2
F700	A6
F701	A5
F710	A5
F736	A3
F737	***A3***
F738	***A3***
F743	B3
F754	***A5***
F755	A6
F800	B7
F801	B6
F802	C5
F803	B5
F804	B5
F900	C5
F901	C5
F902	C6
F903	C5
F904	C6
F905	B6
F906	B6
F907	B5
F908	C5
F909	C5
F910	C6
FB01	B7
FC00	B5
FC01	B5
FC02	B5
FC03	B5
FC04	B5
FC05	C5
FC06	B5
FC07	B4
FC08	B5
FC09	B5
FC10	B4
FD00	C7
FD01	D7
FD02	D7
FD03	D7
FD04	C7
FD05	C6
FD06	C6
FD07	C7
FD08	C7
FD09	C7
FD10	C7
FD11	D7
FD12	C7
FD13	C7
FD14	C7
FD15	C7
FD16	C7
FD17	B6
FE00	***C5***
FE01	***C5***
FE02	***C4***
FE03	B5
FE04	D5
FE05	C5
FE06	D5
FE07	B7
FE08	C4
FE09	C5
FE10	***C4***
FE11	C5
FE12	***C5***
FE13	***C5***
FF00	D6
FF01	D6
FF02	D4
FF03	D7
FF04	D7
FF05	D7
FF06	D6
FF07	D6
FF08	D3
FF09	D7
FF10	D6
FF11	D6
FF12	D6
FF13	D6
FG00	D4
FG01	D4
FG02	D3
FG03	D4
FG04	D3
FG05	D3
FG06	D3
FG07	D3
FG08	D3
FG09	D3
FG10	D2
FG11	D3
FG12	D2
FG13	D2
FG14	D6
FG15	D5
FG16	D6
FG17	D6
FG18	D5
FG19	D5
FG20	D5
FG21	D5
FG22	D5
FG23	D4
FG24	D3
FG25	D3
FG26	D5
FG27	D5
FG28	D5
FG30	D5
FG32	D3
FG33	D3
FG34	D3
FG35	D3
FG36	D4
FG37	D3
FG38	D3
FG39	D4
FG40	D7
FG41	D3
FG42	D4
FG43	D4
FG44	D4
FG45	D4
FG47	D4
FG48	D4
FG49	D4
FG50	D4
FG51	C2
FG53	D4
FG54	D4
FG56	D4
FJ00	A7
FJ01	A5
FJ02	A4
FJ03	A5
FJ04	A5
FJ05	A4
FJ06	A4
FJ07	A5
FJ08	A4
FJ09	A2
FJ10	A2
FJ11	A4
FJ12	A2
FJ13	A2
FJ14	A2
FJ15	A7
FJ16	A7
FJ17	A7
FJ18	A7
FJ19	A7
FJ20	A7
FJ21	A5
FJ22	A5
FJ23	A5
FJ24	A5
FJ25	A5
FJ26	A5
FK00	B1
FK01	B1
FK02	B1
FK03	B1
FK04	B1
FK05	B1
FK06	B1
FK07	C1
FK08	C1
FK09	C1
FK10	B1
FK11	A1
FM01	C4
FM02	C4
FM03	C4
FM04	C4
FM05	C4
FN01	A6
FN02	A6
FN03	A6
FN04	A7
FN05	A7
FN06	A7
FN07	A7
FN08	A7
FN09	A7
FN10	A7
FN11	B6
FN12	A6
FN13	A6
FN14	***A6***
FN15	***A6***
FN16	A6
FN17	A6
FN18	B6
FN19	B5
FN20	A7
FN21	A7
FN22	A7
FN23	A7
FN24	A6
FN25	B6
FN26	A7
FN27	A7
FN28	A7
FN29	A7
FN30	A7
FN31	A7
FN32	A7
FN33	A7
FN34	A7
FN35	A7
FP01	A6
FP02	***A6***
FP03	A6
FP04	***A6***
FP05	***A6***
FP06	A6
FP07	A6
FP08	A7
FP09	A7
FP10	A7
FP11	A7
FP12	A7
FP13	A6
FP14	A7
FP15	A6
FP16	A6
FP17	A7
I101	D2
I102	C2
I103	C2
I104	C2
I105	C2
I106	C2
I107	C2
I108	C2
I109	C2
I110	C2
I111	C1
I112	D2
I113	D2
I201	A2
I202	A2
I203	B2
I204	B2
I205	B2
I206	B2
I207	B2
I208	B2
I209	B2
I210	A3
I211	A3
I212	A3
I213	A2
I214	B2
I215	A2
I216	B2
I217	B3
I218	***A3***
I219	B3
I220	B3
I221	A2
I222	A2
I223	A2
I224	A3
I225	A2
I226	B2
I227	B2
I228	B3
I229	B2
I230	A3
I231	B2
I232	A2
I233	B2
I234	B2
I235	B2
I236	B2
I237	B2
I238	A2
I239	A3
I240	A3
I241	A2
I242	A2
I243	A3
I244	B3
I246	A3
I247	A3
I248	A3
I254	C3
I255	B3
I256	B3
I257	B3
I258	B2
I259	B3
I262	B2
I264	A2
I265	B3
I266	B3
I267	B3
I268	B3
I269	A2
I270	B3
I271	A3
I272	B3
I273	C3
I274	A1
I275	A3
I277	A3
I278	A3
I283	B3
I284	B3
I285	B3
I288	B3
I289	A2
I290	A2
I291	A2
I292	A2
I293	A2
I294	A2
I297	A1
I298	***B3***
I430	A1
I440	B3
I443	B3
I449	A3
I450	A3
I451	A3
I452	A3
I453	A1
I454	A1
I501	A3
I502	A3
I503	A2
I504	A2
I505	A2
I602	***A1***
I603	***A2***
I604	A1
I605	A2
I606	A2
I607	A1
I608	A1
I610	A1
I611	B1
I612	A1
I613	A1
I614	A1
I615	A1
I616	A1
I617	A2
I618	***A1***
I619	A1
I705	A3
I706	A4
I708	A5
I709	A5
I710	A4
I711	A4
I712	A4
I713	A4
I714	A4
I715	A4
I716	A4
I731	A4
I732	A3
I733	***A3***
I734	A3
I735	A3
I736	A3
I740	B3
I741	B3
I742	B3
I747	A5
I748	A5
I749	A5
I750	A6
I751	A5
I752	A5
I753	A5
I754	A5
I755	A5
I756	A6
I757	A5
I758	A5
I759	A5
I760	A6
I800	C6
I801	C5
I802	B5
I803	B5
I804	B6
I805	B5
I806	B5
I807	B5
I808	B5
I809	B5
I810	B5
I811	C7
I812	C6
I813	B7
I815	C6
I816	C6
I817	C6
I818	C4
I819	B5
I820	B6
I821	B5
I822	B5
I900	***B7***
I901	B6
I902	***C6***
I903	C6
I904	B6
I905	B6
I906	C5
IA00	C6
IA03	B4
IA05	C6
IA06	C6
IA07	C6
IA08	B5
IA09	B6
IB02	B7
IB03	B7
ID00	C7
ID01	D7
ID02	C7
ID03	C7
ID04	C7
ID05	C7
ID06	C7
ID07	C7
ID08	C7
ID09	C7
ID10	C7
ID11	C7
ID12	C7
ID13	C6
ID14	C6
ID15	C7
ID16	C7
ID17	C7
ID18	C7
ID19	C7
ID20	C7
ID21	C7
ID22	C6
IE00	D4
IE01	C4
IE02	D5
IE03	C6
IE04	C5
IE05	C5
IE06	C4
IE07	C4
IE08	C4
IE09	C5
IE10	C5
IE11	C5
IE12	C5
IE13	D5
IE14	D4
IE15	D4
IE16	C4
IE17	C4
IE18	C4
IE19	D5
IE20	D5
IE21	D5
IE22	D5
IE23	C5
IE24	C5
IE25	D5
IE26	D5
IE27	C5
IE28	C4
IE29	C4
IE30	C4
IE31	C5
IE32	C5
IE33	C5
IE34	C5
IE35	D5
IE36	C5
IE37	C5
IF00	D7
IF01	D7
IF02	D7
IF03	D7
IF04	D6
IF05	D6
IF06	D7
IF07	D7
IF08	D7
IF11	D6
IF12	D6
IF13	D7
IF14	D7
IF15	D6
IF17	D7
IF20	D7
IF21	D4
IF22	D6
IF23	D6
IG00	D4
IG01	D4
IG02	D4
IG03	D4
IG04	D3
IG05	D3
IG06	D3
IG07	D3
IG08	D3
IG09	D3
IG10	D3
IG11	D3
IG12	D3
IG13	D2
IG14	D6
IG15	D5
IG16	D6
IG17	D5
IG18	D6
IG19	D5
IG20	D6
IG21	D5
IG23	D5
IG24	D5
IG25	D5
IG26	D5
IG27	D4
IG28	D3
IG29	D3
IG30	D3
IG40	D5
IG42	D5
IG43	D4
IG46	D5
IG47	D5
IG49	D4
IG50	D4
IG52	D5
IG53	D5
IG54	D5
IG55	D5
IG56	D5
IG57	D5
IG58	D5
IG59	D4
IG60	D3
IG61	D2
IG62	D2
IG63	D3
IG64	D3
IG67	D3
IG69	D3
IG73	D4
IG75	D5
IG76	D6
IG78	D5
IG79	D5
IG80	D5
IJ01	A3
IJ02	A3
IJ03	A4
IJ04	A3
IJ05	A3
IJ06	A3
IJ07	A3
IJ08	A3
IJ09	A3
IJ10	A3
IJ11	A3
IJ12	A3
IJ13	A3
IK00	A1
IK01	A1
IK02	A1
IK03	A1
IK16	A1
IK17	B1
IK18	B1
IL01	B3
IL02	B3
IL03	B3
IL04	B3
IL05	B3
IL06	B3
IL07	B3
IL08	B3
IL09	B3
IL10	B4
IL11	B4
IL12	B4
IL13	B4
IL14	B4
IL15	B4
IL16	C3
IL17	B3
IL18	B3
IL19	B4
IM00	C4
IM01	C3
IM03	B4
IM04	B4
IM06	B4
IM07	B4
IM08	B4
IM09	B4
IM10	B3
IM11	C3
IN01	A6
IN02	A6
IN03	A6
IN04	A6
IN05	A6
IN06	A6
IN07	B6
IN08	A6
IN09	A6
IN10	A6
IN11	A6
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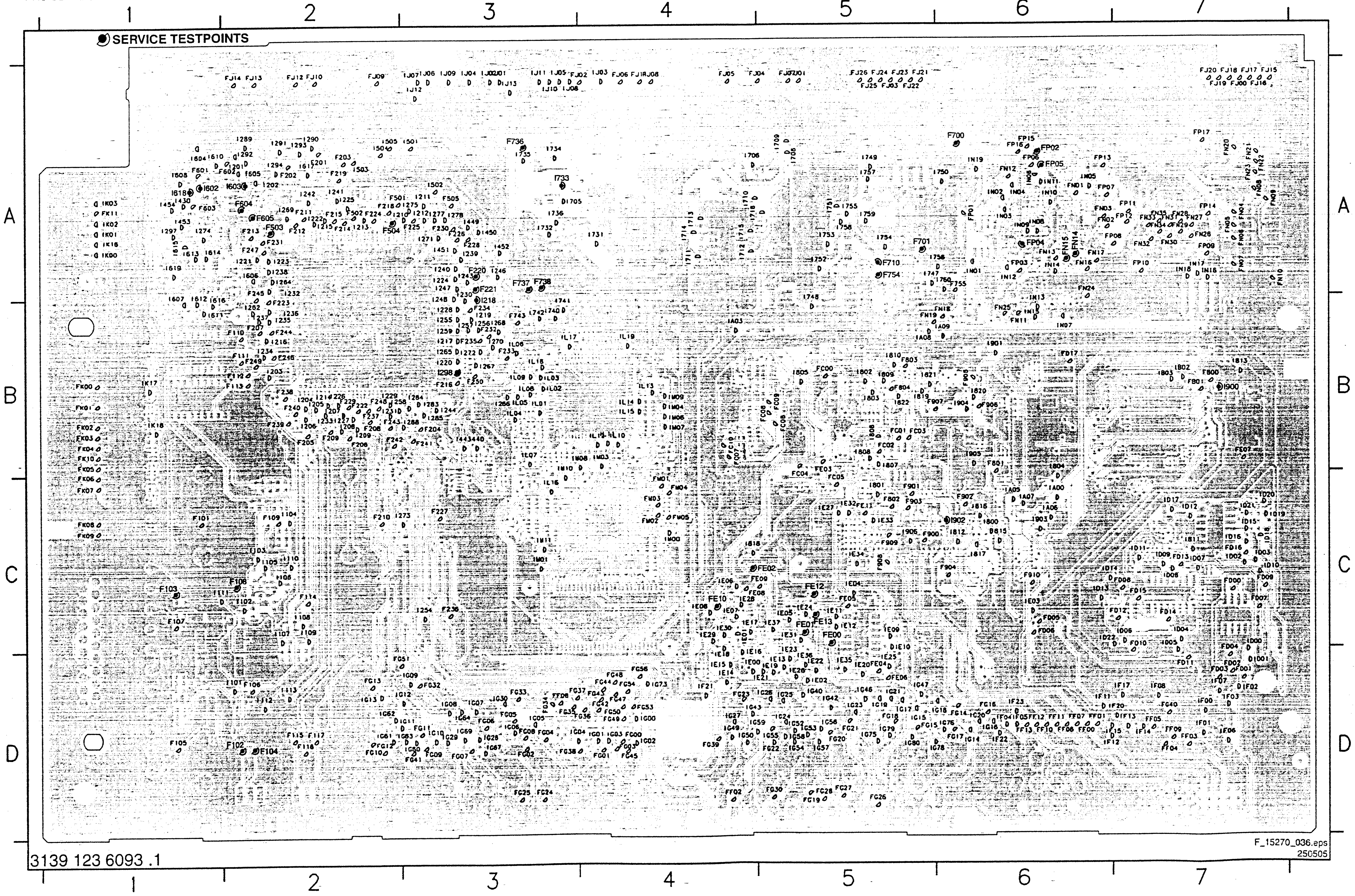
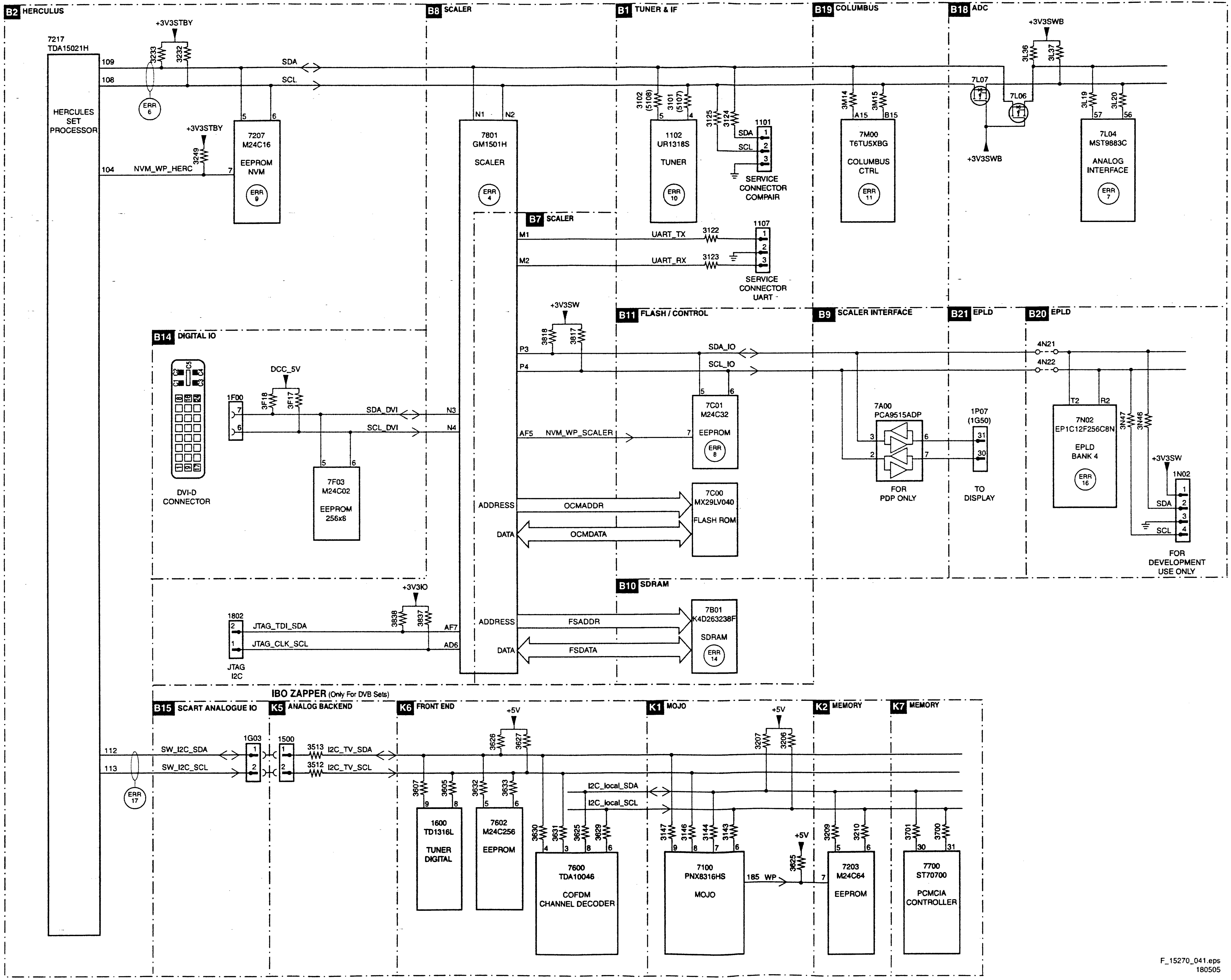
IN13	B6
IN14	A6
IN15	B6
IN16	A7
IN17	A7
IN18	A7
IN19	A6



I2C IC Overview

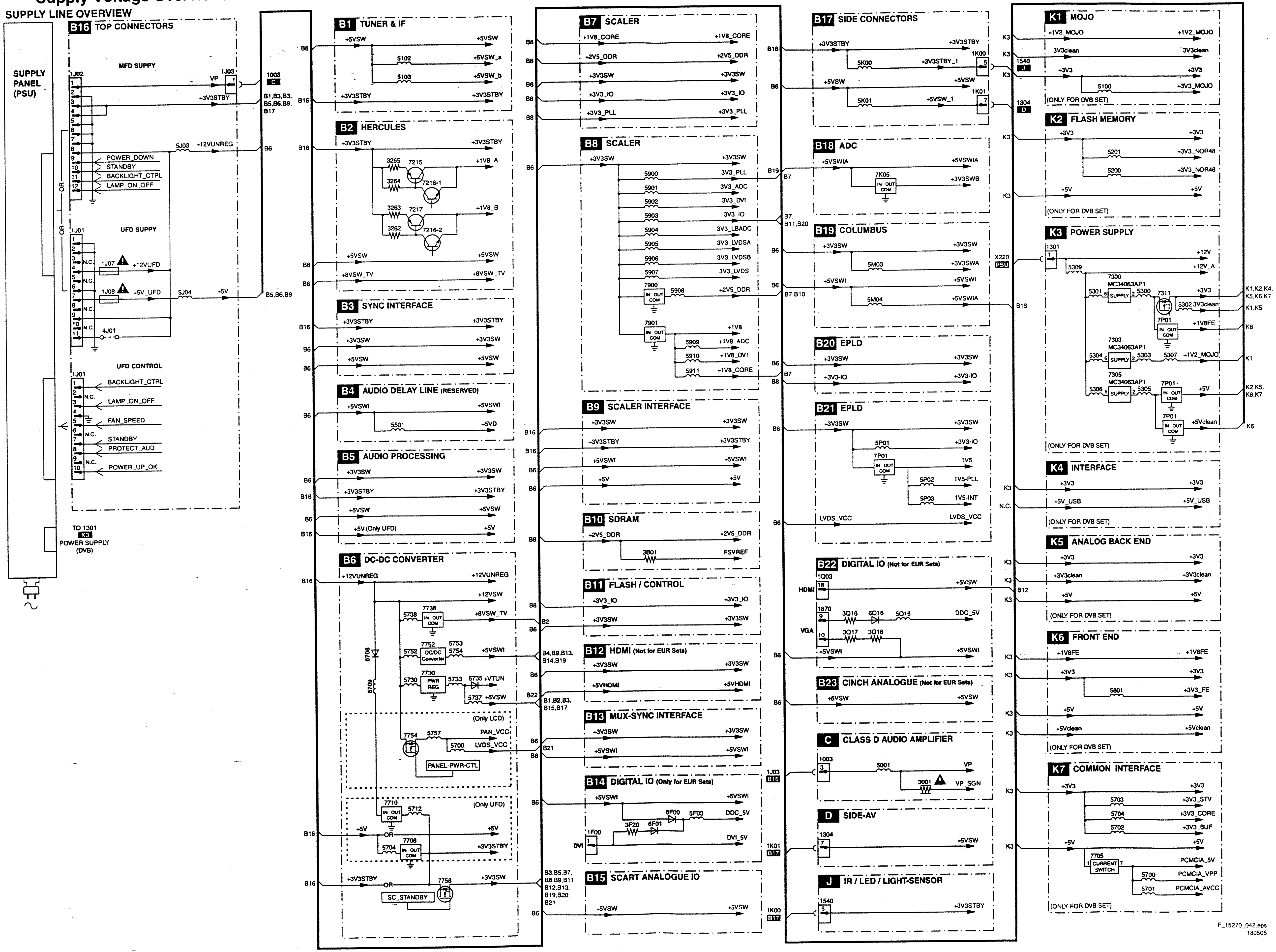
IIC


B2 HERCULUS
7217
TDA15021H
HERCULES SET PROCESSOR
+3V3STBY
3233
3232
109
108
SDA
SCL
ERR 6
+3V3STBY
3249
104
NVM_WP_HERC
7207
M24C16
EEPROM NVM
ERR 9
B8 SCALER
N1
N2
7801
GM1501H
SCALER
ERR 4
B7 SCALER
M1
M2
UART_TX
UART_RX
3122
3123
1107
SERVICE CONNECTOR UART
B1 TUNER & IF
3102 (5108)
3101 (5107)
1102
UR1318S
TUNER
ERR 10
3125
3124
1101
SERVICE CONNECTOR COMPAIR
B19 COLUMBUS
3M14
3M15
A15
B15
7M00
T6TU5XBG
COLUMBUS CTRL
ERR 11
B18 ADC
+3V3SWB
3L36
3L37
7L07
7L06
+3V3SWB
3L19
3L20
57
56
7L04
MST9883C
ANALOG INTERFACE
ERR 7
B14 DIGITAL IO
DVI-D CONNECTOR
DCC_5V
3F18
3F17
1F00
SDA_DVI
SCL_DVI
N3
N4
7F03
M24C02
EEPROM 256x8
+3V3SW
3818
3817
P3
P4
AF5
NVM_WP_SCALER
ADDRESS
DATA
OCMADDR
OCMDATA
B11 FLASH / CONTROL
SDA_IO
SCL_IO
7C01
M24C32
EEPROM
ERR 8
7C00
MX29LV040
FLASH ROM
B9 SCALER INTERFACE
7A00
PCA9515ADP
FOR PDP ONLY
B21 EPLD
1P07 (1G50)
TO DISPLAY
B20 EPLD
4N21
4N22
T2
R2
7N02
EP1C12F256C8N
EPLD BANK 4
ERR 16
3N47
3N46
+3V3SW
1N02
FOR DEVELOPMENT USE ONLY
+3V3IO
3838
3837
1802
JTAG_TDI_SDA
JTAG_CLK_SCL
AF7
AD6
JTAG I2C
B10 SDRAM
ADDRESS
DATA
FSADDR
FSDATA
7B01
K4D263238F
SDRAM
ERR 14
IBO ZAPPER (Only For DVB Sets)
B15 SCART ANALOGUE IO
112
113
SW_I2C_SDA
SW_I2C_SCL
ERR 17
1G03
K5 ANALOG BACKEND
1500
3513
3512
I2C_TV_SDA
I2C_TV_SCL
K6 FRONT END
+5V
3626
3627
3607
3605
3632
3633
1600
TD1316L
TUNER DIGITAL
7602
M24C256
EEPROM
3630
3631
3625
3629
7600
TDA10046
COFDM CHANNEL DECODER
I2C_local_SDA
I2C_local_SCL
K1 MOJO
+5V
3207
3206
3147
3146
3144
3143
7100
PNX8316HS
MOJO
185 WP
+5V
3625
K2 MEMORY
3209
3210
7203
M24C64
EEPROM
K7 MEMORY
3701
3700
7700
ST70700
PCMCIA CONTROLLER

F_15270_041.eps
180505

Supply Voltage Overview

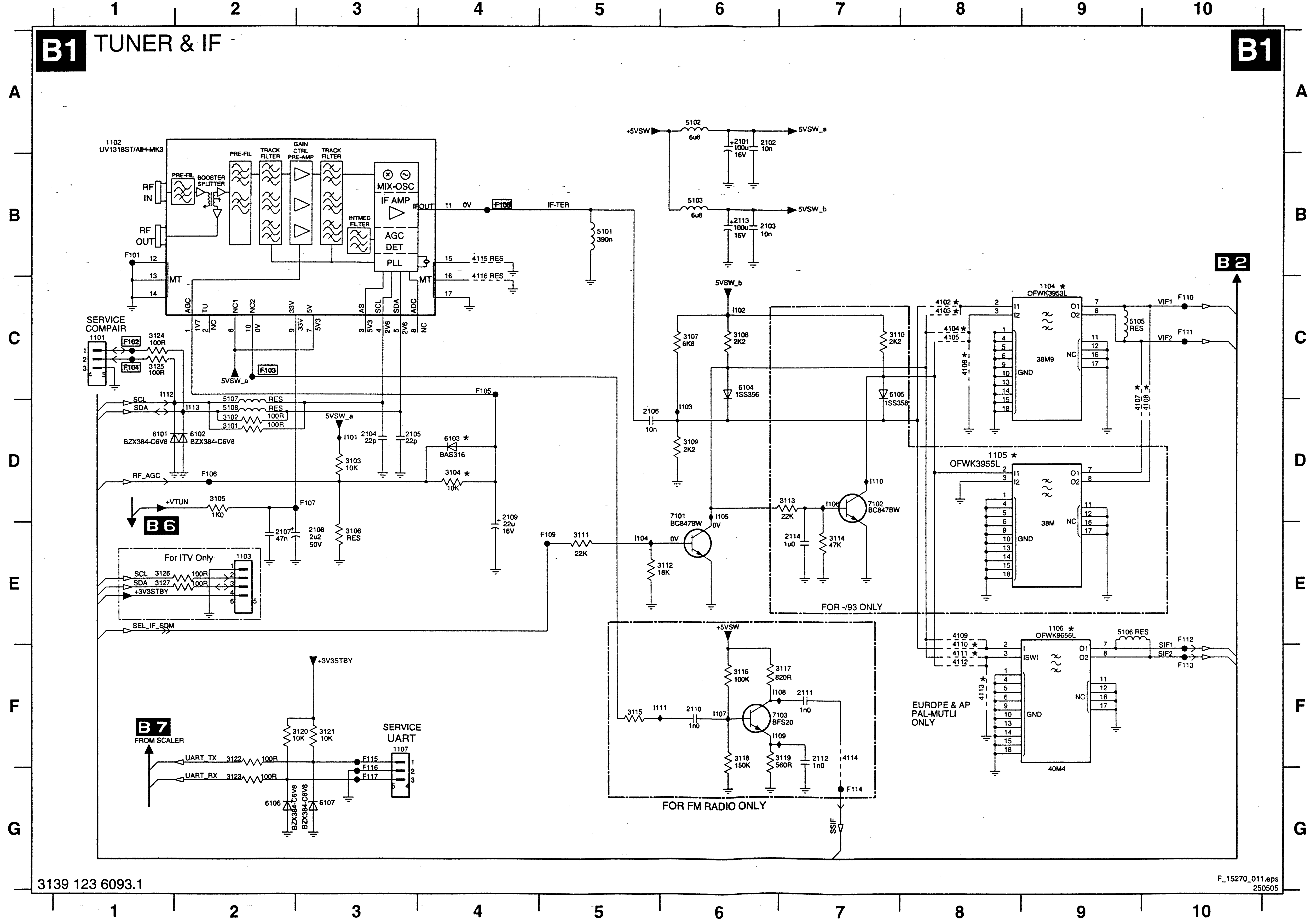
SUPPLY LINE OVERVIEW


SUPPLY PANEL (PSU)
B16 TOP CONNECTORS
MFD SUPPY
UFD SUPPY
UFD CONTROL
POWER_DOWN
STANDBY
BACKLIGHT_CTRL
LAMP_ON_OFF
FAN_SPEED
PROTECT_AUD
POWER_UP_OK
+12VUNREG
+3V3STBY
+12VUFD
+5V_UFD
TO 1301
K3
POWER SUPPLY (DVB)
B1 TUNER & IF
B2 HERCULES
B3 SYNC INTERFACE
B4 AUDIO DELAY LINE (RESERVED)
B5 AUDIO PROCESSING
B6 DC-DC CONVERTER
(Only LCD)
(Only UFD)
PANEL-PWR-CTL
SC_STANDBY
B7 SCALER
B8 SCALER
B9 SCALER INTERFACE
B10 SDRAM
B11 FLASH / CONTROL
B12 HDMI (Not for EUR Sets)
B13 MUX-SYNC INTERFACE
B14 DIGITAL IO (Only for EUR Sets)
B15 SCART ANALOGUE IO
B17 SIDE CONNECTORS
B18 ADC
B19 COLUMBUS
B20 EPLD
B21 EPLD
B22 DIGITAL IO (Not for EUR Sets)
B23 CINCH ANALOGUE (Not for EUR Sets)
C CLASS D AUDIO AMPLIFIER
D SIDE-AV
J IR / LED / LIGHT-SENSOR
K1 MOJO
K2 FLASH MEMORY
K3 POWER SUPPLY
K4 INTERFACE
K5 ANALOG BACK END
K6 FRONT END
K7 COMMON INTERFACE
(ONLY FOR DVB SET)

F_15270_042.eps
180505

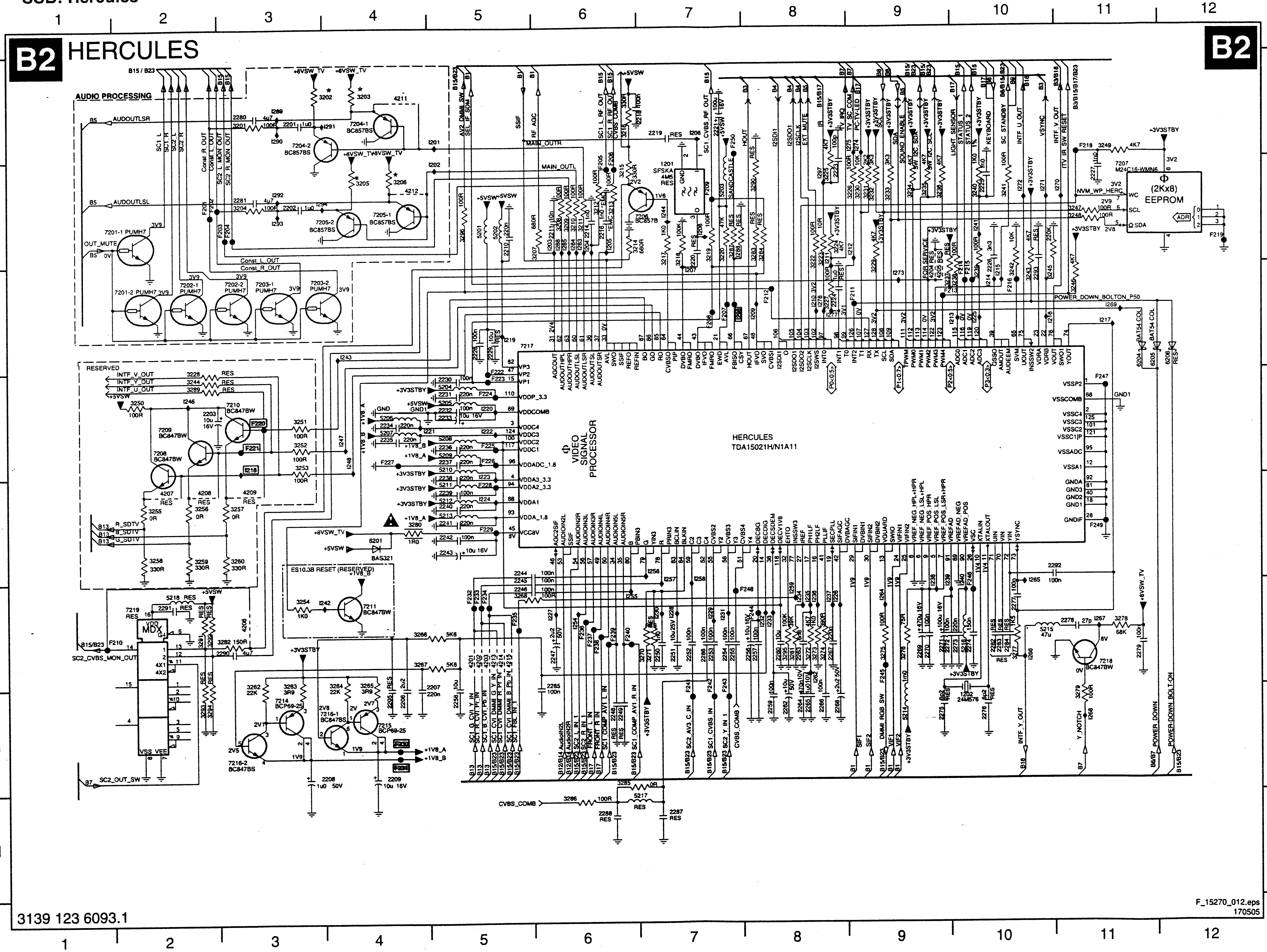
7. Circuit Diagrams and PWB Layouts

SSB: Tuner and VIF


B1 TUNER & IF
B1
1102
UV1318ST/AIH-MK3
RF IN
RF OUT
PRE-FIL
BOOSTER SPLITTER
TRACK FILTER
GAIN CTRL PRE-AMP
INTMED FILTER
MIX-OSC
IF AMP
AGC DET
PLL
IFOUT
MT
AGC TU NC1 NC2 33V 5V AS SCL SDA ADC
F101
F108
IF-TER
5101 390n
4115 RES
4116 RES
+5VSW
5102 6u8
5VSW_a
2101 100u 16V
2102 10n
5103 6u8
5VSW_b
2113 100u 16V
2103 10n
SERVICE COMPAIR
1101
F102
F104
3124 100R
3125 100R
5VSW_a
F103
F105
SCL
SDA
I112
I113
5107 RES
5108 RES
3102 100R
3101 100R
6101 BZX384-C6V8
6102 BZX384-C6V8
5VSW_a
I101
2104 22p
2105 22p
6103 ★ BAS316
3103 10K
RF_AGC
F106
3104 ★ 10K
+VTUN
3105 1K0
F107
B6
2107 47n
2108 2u2 50V
3106 RES
2109 22u 16V
For ITV Only
1103
SCL 3126 100R
SDA 3127 100R
+3V3STBY
SEL_IF_SDM
F109
3111 22K
I104
0V
7101 BC847BW
I105
3112 18K
5VSW_b
I102
3107 6K8
3108 2K2
6104 1SS356
2106 10n
I103
3109 2K2
3110 2K2
6105 1SS356
I110
3113 22K
I106
7102 BC847BW
2114 1u0
3114 47K
FOR -/93 ONLY
1104 ★ OFWK3953L
38M9
4102 ★
4103 ★
4104 ★
4105
4106 ★
4107 ★
4108 ★
5105 RES
VIF1 F110
VIF2 F111
B2
1105 ★ OFWK3955L
38M
+3V3STBY
B7 FROM SCALER
UART_TX 3122 100R
UART_RX 3123 100R
3120 10K
3121 10K
6106 BZX384-C6V8
6107 BZX384-C6V8
F115
F116
F117
SERVICE UART
1107
+5VSW
3116 100K
3117 820R
I108
2111 1n0
3115
I111
2110 1n0
I107
7103 BFS20
I109
3118 150K
3119 560R
2112 1n0
4114
F114
SSIF
FOR FM RADIO ONLY
4109
4110 ★
4111 ★
4112
4113 ★
1106 ★ OFWK9656L
5106 RES
SIF1 F112
SIF2 F113
ISWI
40M4
EUROPE & AP PAL-MUTLI ONLY
GND
NC
1 2 3 4 5 6 7 8 9 10
A B C D E F G
3139 123 6093.1
F_15270_011.eps 250505

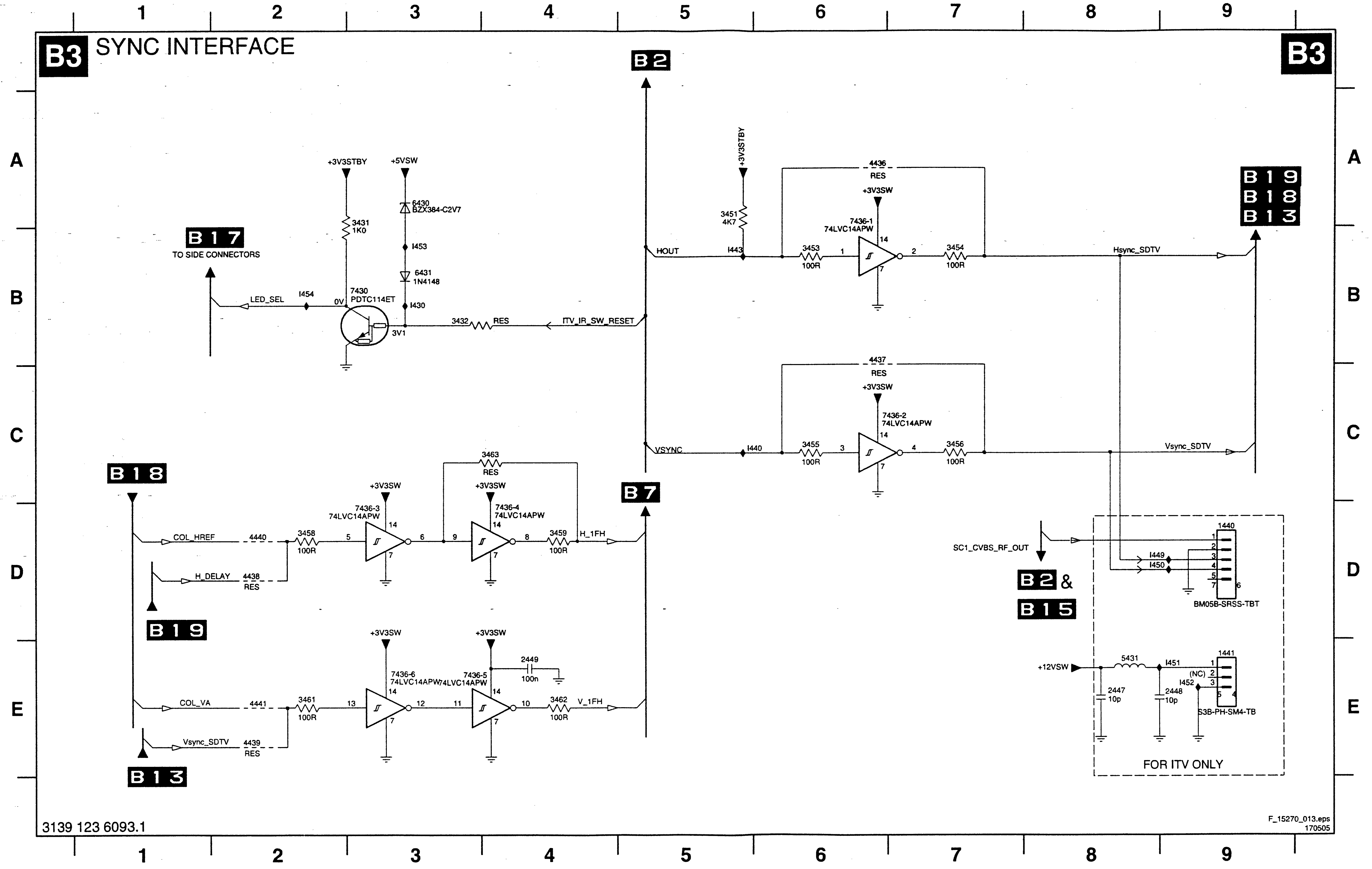
1101	C1
1102	A1
1103	E2
1104	C9
1105	D8
1106	E9
1107	F3
2101	A6
2102	A6
2103	B6
2104	D3
2105	D3
2106	D5
2107	E2
2108	E3
2109	D4
2110	F6
2111	F7
2112	F7
2113	B6
2114	E7
3101	D2
3102	D2
3103	D3
3104	D4
3105	D2
3106	E3
3107	C6
3108	C6
3109	D6
3110	C7
3111	E5
3112	E5
3113	D7
3114	E7
3115	F5
3116	F6
3117	F7
3118	F6
3119	F6
3120	F3
3121	F3
3122	F2
3123	G2
3124	C1
3125	C1
3126	E1
3127	E1
4102	C8
4103	C8
4104	C8
4105	C8
4106	C8
4107	D9
4108	D10
4109	E8
4110	F8
4111	F8
4112	F8
4113	F8
4114	F7
4115	B4
4116	C4
5101	B5
5102	A6
5103	B6
5105	C9
5106	E9
5107	D2
5108	D2
6101	D1
6102	D2
6103	D4
6104	C6
6105	C7
6106	G2
6107	G3
7101	D6
7102	D7
7103	F6
F101	B1
F102	C1
F103	C2
F104	C1
F105	C4
F106	D2
F107	D3
F108	B4
F109	E5
F110	C10
F111	C10
F112	E10
F113	F10
F114	G7
F115	F3
F116	G3
F117	G3
I101	D3
I102	C6
I103	D6
I104	E5
I105	D6
I106	D7
I107	F6
I108	F7
I109	F7
I110	D7
I111	F6
I112	C1
I113	D2

SSB: Hercules



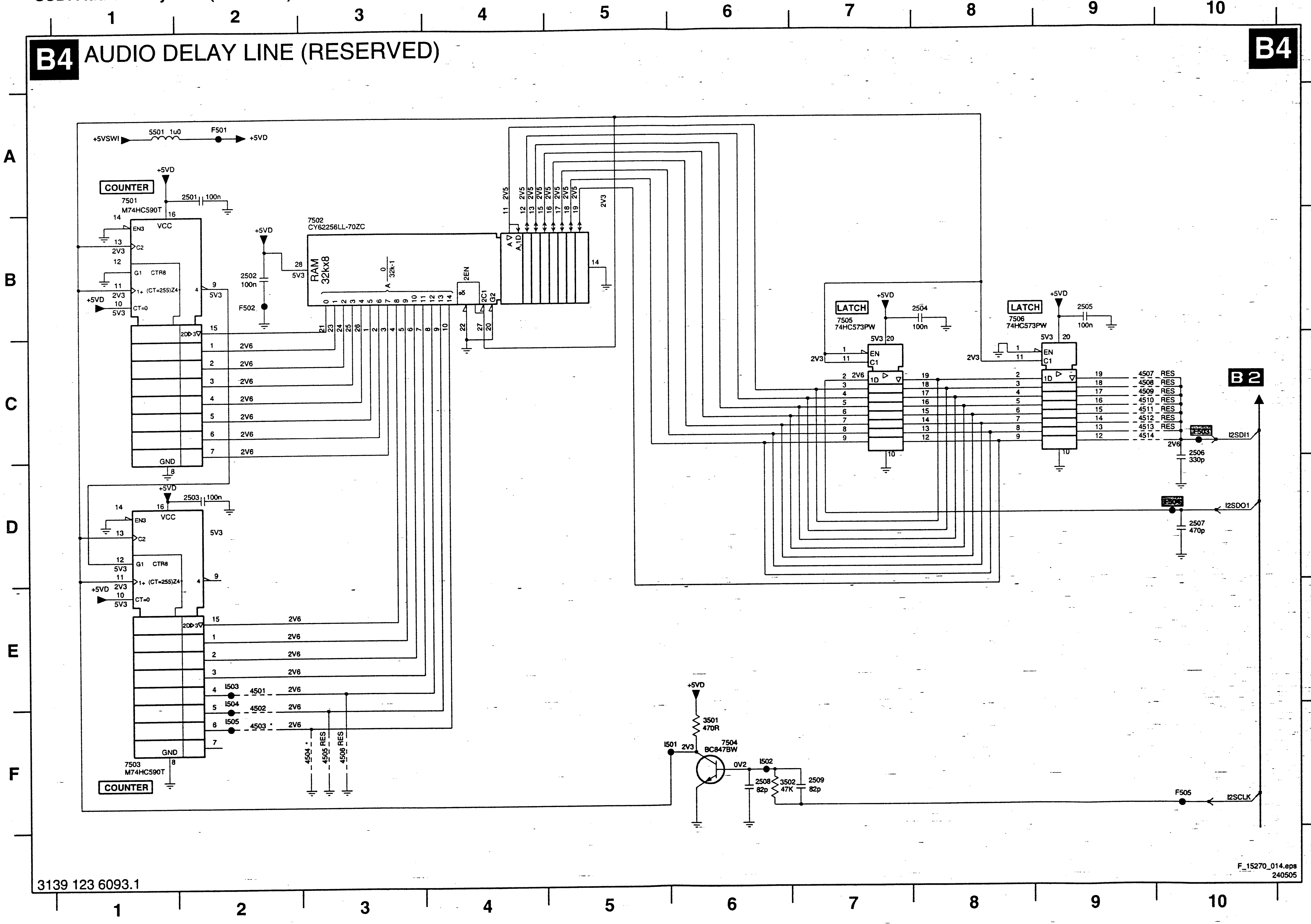
1201	B7
1202	G10
2201	A3
2202	B3
2203	D2
2205	G4
2206	G4
2207	F5
2208	G4
2209	G4
2210	B5
2211	B6
2214	B6
2216	B6
2218	A7
2219	A7
2220	B7
2221	A7
2223	B8
2224	C8
2225	B10
2226	C10
2227	B11
2228	C5
2229	C5
2230	D5
2231	D5
2232	D5
2233	D5
2234	D4
2235	D4
2236	D5
2237	D5
2238	E5
2239	E5
2240	E5
2241	E5
2242	E5
2243	E5
2244	E5
2245	E5
2246	F5
2247	F6
2248	G6
2249	G6
2250	F7
2251	F7
2252	F7
2253	F7
2254	F7
2255	F7
2256	F8
2257	F8
2258	G5
2259	G8
2260	F8
2262	G8
2263	F8
2264	G8
2265	G8
2266	G8
2267	F8
2268	G8
2269	F9
2270	F9
2271	F9
2272	F9
2273	F10
2274	F10
2275	G9
2276	G10
2277	F10
2278	F11
2279	F11
2280	A3
2281	B3
2282	F10
2283	F10
2284	F10
2285	F6
2286	F7
2287	H7
2288	H6
2290	F3
2291	F2
2292	E11
2293	C10
3201	A3
3202	A4
3203	A4
3204	B3
3205	B4
3206	B4
3207	B6
3208	B6
3209	B6
3210	B6
3211	B6
3212	B6
3213	B6
3214	B7
3215	B6
3216	A6
3217	B7
3218	B7
3219	B7
3220	B7
3222	B8
3223	B8
3224	B8
3225	B8
3226	B9
3227	C8
3228	D2
3229	C9
3230	B9
3231	B9
3232	B9
3233	B9
3234	B9
3235	B9
3236	B9
3237	C9
3238	C10
3239	C10
3240	B10
3241	B10
3242	C10
3243	C10
3244	D2
3245	C10
3246	C11
3247	B11
3248	B11
3249	A11
3250	D2
3251	D3
3252	D3
3253	D3
3254	F3
3255	E2
3256	E2
3257	E3
3258	E2
3259	E2
3260	E3
3262	F3
3263	F3
3264	F4
3265	F4
3266	F4
3267	F4
3268	F5
3270	F7
3271	F7
3272	F8
3273	F8
3274	F8
3275	F9
3276	F9
3277	F10
3278	F11
3279	G11
3280	E4
3281	F8
3282	F3
3283	B8
3284	B8
3285	G6
3286	H6
3287	B7
3288	B7
3289	D2
3290	B8
3291	F2
3292	F2
3293	G2
3294	G2
3295	F8
3296	B5
4201	F5
4202	F5
4203	F5
4204	C9
4205	C9
4206	F3
4207	E2
4208	E2
4209	E3
4211	A4
4212	B4
4213	F5
4214	F5
4215	F5
5201	B5
5202	B5
5203	B7
5204	D5
5205	D5
5206	D4
5207	D4
5208	D5
5209	D5
5210	D5
5211	E5
5212	E5
5213	E5
5214	G9
5215	F10
5216	F10
5217	H7
5218	F2
6201	E4
6204	C11
6205	C11
6206	C12
7201-1	B1
7201-2	C2
7202-1	C2
7202-2	C3
7203-1	C3
7203-2	C3
7204-1	A4
7204-2	A3
7205-1	B4
7205-2	B4
7206	B6
7207	B11
7208	D2
7209	D2
7210	D3
7211	F4
7214	G3
7215	G4
7216-1	G3
7216-2	G3
7217	C6
7218	F11
7219	F2
F201	B2
F202	B2
F203	B3
F204	B3
F205	B6
F206	B6
F207	C7
F208	C7
F209	B7
F210	F1
F211	C9
F212	C8
F213	C10
F214	C10
F215	C10
F216	C10
F218	A11
F219	B12
F220	D3
F221	D3
F222	D5
F223	D5
F224	D5
F225	D5
F226	D5
F227	D4
F228	E5
F229	E5
F230	G4
F231	G4
F232	F5
F233	F5
F234	F5
F235	F5
F236	F6
F237	F6
F238	F6
F239	F6
F240	F6
F241	G7
F242	G7
F243	G7
F244	F8
F245	F9
F246	F10
F247	D11
F248	F8
F249	E11
F250	A7
I201	A5
I202	B5
I203	B6
I204	B6
I205	B6
I206	A7
I207	C7
I208	B7
I209	C8
I210	C8
I211	B8
I212	B9
I213	C10
I214	C10
I215	C10
I216	C10
I217	C11
I218	D3
I219	C5
I220	D5
I221	D5
I222	D5
I223	D5
I224	E5
I225	C10
I226	F8
I227	F6
I228	F7
I229	F7
I230	F7
I231	F7
I232	F8
I233	F8
I234	F8
I235	F8
I236	F8
I237	F8
I238	F9
I239	F9
I240	F10
I241	B10
I242	F4
I243	C4
I244	B7
I246	D2
I247	D4
I248	D4
I254	F6
I255	F6
I256	E7
I257	E7
I258	E7
I259	F8
I262	F8
I264	F9
I265	F10
I266	F10
I267	F11
I268	G11
I269	C11
I270	B11
I271	B10
I272	B10
I273	C9
I274	A9
I275	A9
I277	C8
I278	C8
I283	B6
I284	B6
I285	B6
I288	B6
I289	A3
I290	A3
I291	A4
I292	B3
I293	B3
I294	B3
I297	B8
I298	C7

SSB: Sync Interface


B3 SYNC INTERFACE
B3
B2
B17
TO SIDE CONNECTORS
LED_SEL
I454
0V
+3V3STBY
3431
1K0
7430
PDTC114ET
3V1
+5VSW
6430
BZX384-C2V7
I453
6431
1N4148
I430
3432 RES
ITV_IR_SW_RESET
HOUT
I443
+3V3STBY
3451
4K7
4436
RES
+3V3SW
7436-1
74LVC14APW
3453
100R
3454
100R
Hsync_SDTV
B19
B18
B13
VSYNC
I440
4437
RES
7436-2
74LVC14APW
3455
100R
3456
100R
Vsync_SDTV
B18
COL_HREF
4440
3458
100R
7436-3
74LVC14APW
3463
RES
7436-4
74LVC14APW
3459
100R
H_1FH
B7
H_DELAY
4438
RES
B19
COL_VA
4441
3461
100R
7436-6
74LVC14APW
7436-5
74LVC14APW
2449
100n
3462
100R
V_1FH
Vsync_SDTV
4439
RES
B13
SC1_CVBS_RF_OUT
B2 &
B15
1440
I449
I450
BM05B-SRSS-TBT
+12VSW
5431
I451
(NC)
I452
2447
10p
2448
10p
1441
S3B-PH-SM4-TB
FOR ITV ONLY
3139 123 6093.1
F_15270_013.eps
170505
1 2 3 4 5 6 7 8 9
A B C D E

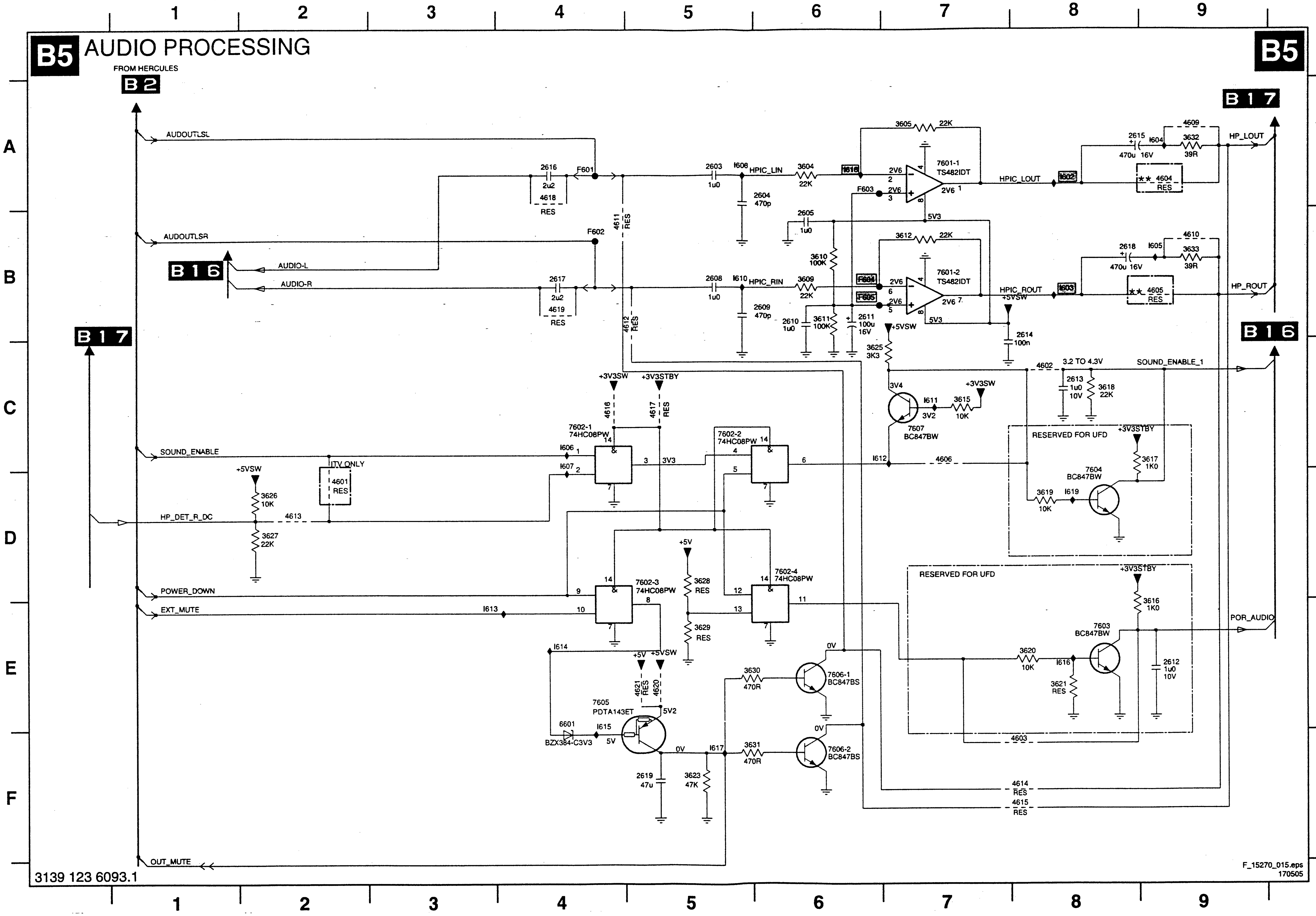
1440	D9
1441	E9
2447	E8
2448	E9
2449	E4
3431	A3
3432	B3
3451	A5
3453	B6
3454	B7
3455	C6
3456	C7
3458	D2
3459	D4
3461	E2
3462	E4
3463	C4
4436	A6
4437	B6
4438	D2
4439	E2
4440	D2
4441	E2
5431	E8
6430	A3
6431	B3
7430	B3
7436-1	A6
7436-2	C7
7436-3	D3
7436-4	D4
7436-5	E4
7436-6	E3
I430	B3
I440	C6
I443	B5
I449	D8
I450	D8
I451	E9
I452	E9
I453	B3
I454	B2

SSB: Audio Delay Line (Reserved)


B4 AUDIO DELAY LINE (RESERVED)
B4
COUNTER
7501
M74HC590T
7502
CY62256LL-70ZC
RAM
32kx8
LATCH
7505
74HC573PW
LATCH
7506
74HC573PW
7503
M74HC590T
COUNTER
7504
BC847BW
3501
470R
3502
47K
2501 100n
2502 100n
2503 100n
2504 100n
2505 100n
2506 330p
2507 470p
2508 82p
2509 82p
5501 1u0
F501
F502
F503
F504
F505
I501
I502
I503
I504
I505
+5VSWI
+5VD
B2
I2SDI1
I2SDO1
I2SCLK
3139 123 6093.1
F_15270_014.eps
240505

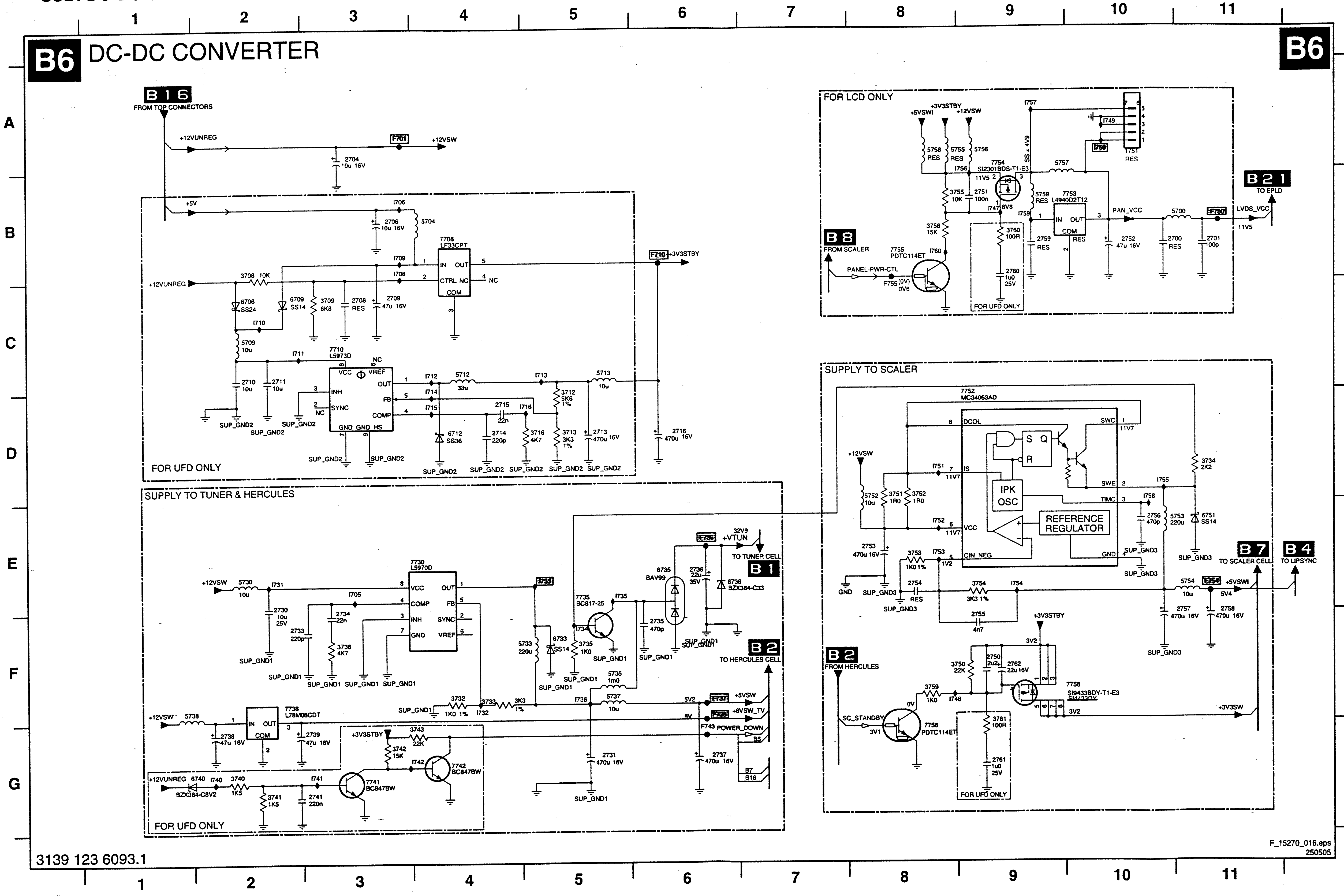
2501	A2
2502	B2
2503	D2
2504	B8
2505	B9
2506	C10
2507	D10
2508	F6
2509	F7
3501	F6
3502	F6
4501	E2
4502	F2
4503	F2
4504	F3
4505	F3
4506	F3
4507	C9
4508	C9
4509	C9
4510	C9
4511	C9
4512	C9
4513	C9
4514	C9
5501	A1
7501	A1
7502	B3
7503	F1
7504	F6
7505	B7
7506	B8
F501	A2
F502	B2
F503	C10
F504	D10
F505	F10
I501	F5
I502	F6
I503	E2
I504	E2
I505	F2

SSB: Audio Processing


B5
AUDIO PROCESSING
FROM HERCULES
B2
B17
B16
AUDOUTLSL
AUDOUTLSR
AUDIO-L
AUDIO-R
SOUND_ENABLE
HP_DET_R_DC
POWER_DOWN
EXT_MUTE
OUT_MUTE
HPIC_LIN
HPIC_RIN
HPIC_LOUT
HPIC_ROUT
HP_LOUT
HP_ROUT
SOUND_ENABLE_1
POR_AUDIO
7601-1 TS482IDT
7601-2 TS482IDT
7602-1 74HC08PW
7602-2 74HC08PW
7602-3 74HC08PW
7602-4 74HC08PW
7603 BC847BW
7604 BC847BW
7605 PDTA143ET
7606-1 BC847BS
7606-2 BC847BS
7607 BC847BW
6601 BZX384-C3V3
RESERVED FOR UFD
ITV ONLY
3.2 TO 4.3V
+5VSW
+3V3SW
+3V3STBY
+5V
3139 123 6093.1
F_15270_015.eps
170505

2603	A5
2604	A6
2605	B6
2608	B5
2609	B6
2610	B6
2611	B6
2612	E9
2613	C8
2614	B8
2615	A8
2616	A4
2617	B4
2618	B8
2619	F5
3604	A6
3605	A7
3609	B6
3610	B6
3611	B6
3612	B7
3615	C7
3616	E9
3617	C9
3618	C8
3619	D8
3620	E8
3621	E8
3623	F5
3625	C6
3626	D2
3627	D2
3628	D5
3629	E5
3630	E5
3631	F5
3632	A9
3633	B9
4601	D2
4602	C8
4603	F8
4604	A9
4605	B9
4606	C7
4609	A9
4610	B9
4611	B4
4612	B4
4613	D2
4614	F8
4615	F8
4616	C4
4617	C5
4618	A4
4619	B4
4620	E5
4621	E5
6601	E4
7601-1	A7
7601-2	B7
7602-1	C4
7602-2	C5
7602-3	D5
7602-4	D6
7603	E8
7604	D8
7605	E4
7606-1	E6
7606-2	F6
7607	C7
F601	A4
F602	B4
F603	A6
F604	B6
F605	B6
I602	A8
I603	B8
I604	A9
I605	B9
I606	C4
I607	C4
I608	A5
I610	B5
I611	C7
I612	C6
I613	E3
I614	E4
I615	E4
I616	E8
I617	F5
I618	A6
I619	D8

SSB: DC-DC Converter


B6
DC-DC CONVERTER
B6
B16
FROM TOP CONNECTORS
+12VUNREG
F701
+12VSW
2704 10u 16V
+5V
I706
2706 10u 16V
5704
7708 LF33CPT
IN OUT
CTRL NC
COM
F710
+3V3STBY
NC
3708 10K
6708 SS24
6709 SS14
3709 6K8
2708 RES
2709 47u 16V
I709
I708
I710
5709 10u
I711
7710 L5973D
VCC VREF
INH
SYNC
OUT
FB
COMP
GND GND HS
2710 10u
2711 10u
SUP_GND2
5712 33u
2715 22n
6712 SS36
2714 220p
3716 4K7
3712 5K6 1%
3713 3K3 1%
2713 470u 16V
5713 10u
2716 470u 16V
FOR UFD ONLY
SUPPLY TO TUNER & HERCULES
7730 L5970D
VCC OUT
COMP FB
INH SYNC
GND VREF
+12VSW
5730 10u
I731
I705
2730 10u 25V
2733 220p
2734 22n
3736 4K7
SUP_GND1
F735
5733 220u
6733 SS14
3735 1K0
7735 BC817-25
2735 470p
6735 BAV99
2736 22u 35V
6736 BZX384-C33
F736
32V9
+VTUN
TO TUNER CELL
B1
B2
TO HERCULES CELL
5735 1m0
5737 10u
5V2
F737
+5VSW
F738
+8VSW_TV
8V
F743
POWER_DOWN
3732 1K0 1%
3733 3K3 1%
5738
7738 L78M08CDT
IN OUT
COM
2738 47u 16V
2739 47u 16V
+3V3STBY
3743 22K
3742 15K
7742 BC847BW
7741 BC847BW
+12VUNREG
6740 BZX384-C8V2
3740 1K5
3741 1K5
2741 220n
2731 470u 16V
2737 470u 16V
B7
B16
FOR UFD ONLY
FOR LCD ONLY
+3V3STBY
+5VSWI
+12VSW
5758 RES
5755 RES
5756
7754 SI2301BDS-T1-E3
3755 10K
2751 100n
6V8
3758 15K
3760 100R
2760 1u0 25V
FOR UFD ONLY
B8
FROM SCALER
PANEL-PWR-CTL
F755
7755 PDTC114ET
5759 RES
7753 L4940D2T12
IN OUT
COM
2759 RES
RES
5757
1751 RES
I749
I750
B21
TO EPLD
PAN_VCC
5700
F700
LVDS_VCC
11V5
2752 47u 16V
2700 RES
2701 100p
SUPPLY TO SCALER
7752 MC34063AD
DCOL
SWC
IS
S Q
R
IPK OSC
SWE
TIMC
VCC
REFERENCE REGULATOR
CIN_NEG
GND
+12VSW
5752 10u
3751 1R0
3752 1R0
11V7
3734 2K2
2756 470p
5753 220u
6751 SS14
2753 470u 16V
3753 1K0 1%
2754 RES
3754 3K3 1%
2755 4n7
SUP_GND3
5754 10u
F754
+5VSWI
5V4
2757 470u 16V
2758 470u 16V
B7
TO SCALER CELL
B4
TO UPSYNC
+3V3STBY
3V2
3750 22K
2750 2u2
2762 22u 16V
7758 SI9433BDY-T1-E3
B2
FROM HERCULES
SC_STANDBY
3759 1K0
7756 PDTC114ET
3761 100R
2761 1u0 25V
FOR UFD ONLY
+3V3SW
3139 123 6093.1
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250505

1751	A10
2700	B11
2701	B11
2704	A3
2706	B3
2708	C3
2709	C3
2710	C2
2711	C2
2713	D5
2714	D4
2715	D4
2716	D6
2730	E2
2731	G5
2733	F2
2734	E3
2735	F6
2736	E6
2737	G6
2738	G2
2739	G3
2741	G3
2750	F9
2751	B9
2752	B10
2753	E8
2754	E8
2755	F9
2756	E10
2757	E11
2758	E11
2759	B9
2760	B9
2761	G9
2762	F9
3708	B2
3709	C3
3712	D5
3713	D5
3716	D5
3732	F4
3733	F4
3734	D11
3735	F5
3736	F3
3740	G2
3741	G2
3742	G3
3743	G4
3750	F9
3751	D8
3752	D8
3753	E8
3754	E9
3755	B9
3758	B8
3759	F8
3760	B9
3761	F9
5700	B11
5704	B4
5709	C2
5712	C4
5713	C5
5730	E2
5733	F5
5735	F5
5737	F5
5738	F1
5752	D8
5753	E11
5754	E11
5755	A9
5756	A9
5757	A9
5758	A8
5759	B9
6708	C2
6709	C2
6712	D4
6733	F5
6735	E6
6736	E6
6740	G2
6751	E11
7708	B4
7710	C3
7730	E3
7735	E5
7738	F2
7741	G3
7742	G4
7752	D9
7753	B10
7754	A9
7755	B8
7756	G8
7758	F10
F700	B11
F701	A3
F710	B6
F736	E6
F737	F6
F738	F6
F743	G6
F754	E11
F755	C8
I705	E3
I706	B3
I708	B3
I709	B3
I710	C2
I711	C2
I712	C4
I713	C5
I714	C4
I715	D4
I716	D5
I731	E2
I732	F4
I733	E5
I734	F5
I735	E5
I736	F5
I740	G2
I741	G3
I742	G4
I747	B9
I748	F8
I749	A10
I750	A10
I751	D8
I752	E8
I753	E8
I754	E9
I755	D10
I756	B9
I757	A9
I758	D10
I759	B9
I760	B8

SSB: Diversity Tables B1-B6

B1 TUNER & IF

Item	AP - non China	Europe	NAFTA/LT	AP - DVB	Europe - DVB	China	Description
1102						V	TUN V+U PLL IEC BGDKM B
1102		V					TUN V+U PLL IEC BGHIL B
1102			V				TUNER UV1338/A F S H-4
1102	V						TUNER UV1316E/A I H-4
1102				V	V		TUNER UV1318SD/A CP H N-4
1104		V			V		FIL SAW SM 38MHZ9 OFWK3953L R
1104						V	FIL SAW SM 38MHZ OFWM3956L R
1104			V				FIL SAW SM 45MHZ75 OFWM1967L R
1104	V			V			FIL SAW SM 38MHZ9 OFWK7265L R
1105						V	FIL SAW SM 38MHZ OFWK3955L R
1106		V			V		FIL SAW SM 38MHZ9 OFWK9656L R
1106						V	FIL SAW SM 38MHZ OFWK9352L R
1106	V			V			FIL SAW SM 38MHZ9 OFWK9361L R
3101	V		V			V	RST SM 0603 100R PM5 COL
3102	V		V			V	RST SM 0603 100R PM5 COL
3104		V			V		RST SM 0603 10K PM5COL
3104	V		V	V		V	RST SM 0603 JUMP. 0R05 COL
3107	V	V		V	V	V	RST SM 0603 6K8 PM5 COL
3108	V	V		V	V	V	RST SM 0603 2K2 PM5 COL
3109	V	V		V	V	V	RST SM 0603 2K2 PM5 COL
3110						V	RST SM 0603 2K2 PM5 COL
3111	V	V		V	V	V	RST SM 0603 22K PM5 COL
3112	V	V		V	V	V	RST SM 0603 18K PM5 COL
3113						V	RST SM 0603 22K PM5 COL
3114						V	RST SM 0603 47K PM5 COL
4102	V	V	V	V	V		RST SM 0603 JUMP. 0R05 COL
4103						V	RST SM 0603 JUMP. 0R05 COL
4104	V			V			RST SM 0603 JUMP. 0R05 COL
4106		V	V		V	V	RST SM 0603 JUMP. 0R05 COL
4107						V	RST SM 0603 JUMP. 0R05 COL
4108						V	RST SM 0603 JUMP. 0R05 COL
4110	V	V		V	V	V	RST SM 0603 JUMP. 0R05 COL
4111		V			V		RST SM 0603 JUMP. 0R05 COL
4113	V			V		V	RST SM 0603 JUMP. 0R05 COL
5101	V	V		V	V	V	FXDIND SM 0805 0U39 PM10 COL R
5101			V				FXDIND SM 0805 0U68 PM10 COL R
5102	V	V	V	V		V	FXDIND SM 0805 12U PM10 COL R
5102					V		FXDIND SM 1008 6U8 PM5 COL R
5107				V	V		FXDIND 0603 100MHZ 600R COL R
5107		V					RST SM 0603 100R PM5 COL
5108				V	V		FXDIND 0603 100MHZ 600R COL R
5108		V					RST SM 0603 100R PM5 COL
6103		V			V		DIO SIG SM BAS316 (COL) R
6105						V	DIO SIG SM 1SS356 (RHM0) R
7101	V	V		V	V	V	TRA SIG SM BC847BW (COL) R
7102						V	TRA SIG SM BC847BW (COL) R

B2 HERCULES

Item	LC4.3A AB (DVB-T)	LC4.3E AB/LC4.8E AB/LC4.9E AB (DVB-T)	LC4.3U/L	LC4.3E/LC4.8E/LC4.9E	LC4.3E W/O 3D COMB FILTER	LC4.3A - CHINA	LC4.3A - AP (non-China)	Description
2203	V	V		V	V	V	V	ELCAP SM 16V 10U PM20 COL R
2229			V					CER2 0805 X5R 6V3 10U PM10 R
2244	V	V		V	V			CER2 0402 Y5V 16V 100N COL
2245	V	V		V	V			CER2 0402 Y5V 16V 100N COL
2246	V	V		V	V			CER2 0402 Y5V 16V 100N COL
2255	V	V	V	V		V	V	CER2 0402 Y5V 16V 100N COL
2286	V	V	V	V		V	V	CER2 0402 Y5V 16V 100N COL
2289	V							CER2 0805 Y5V 10V 4U7 P8020 R
2289				V				RST SM 0603 150R PM5 COL
2290	V	V		V	V			CER2 0805 Y5V 10V 4U7 P8020 R
2291	V	V		V				CER2 0402 Y5V 16V 100N COL
2292		V						CER2 0402 Y5V 16V 100N COL
3250		V		V	V	V	V	RST SM 0402 100R PM5 COL
3251		V		V	V	V	V	RST SM 0402 100R PM5 COL
3252		V		V	V	V	V	RST SM 0402 100R PM5 COL
3253		V		V	V	V	V	RST SM 0402 100R PM5 COL
3255		V		V	V	V	V	RST SM 0402 JUMP. 0R05 COL
3256		V		V	V	V	V	RST SM 0402 JUMP. 0R05 COL
3257		V		V	V	V	V	RST SM 0402 JUMP. 0R05 COL
3258		V		V	V	V	V	RST SM 0402 1K PM5 COL
3259		V		V	V	V	V	RST SM 0402 1K PM5 COL
3260		V		V	V	V	V	RST SM 0402 1K PM5 COL
3270								RST SM 0402 10K PM5 COL
3282		V						RST SM 0603 150R PM5 COL
3285	V	V	V	V		V	V	RST SM 0402 JUMP. 0R05 COL
3286	V	V	V	V		V	V	RST SM 0402 100R PM5 COL
3291	V							RST SM 0402 47K PM5 COL
3292		V		V				RST SM 0402 12K PM5 COL
3292	V							RST SM 0402 47K PM5 COL
3293	V							RST SM 0402 47K PM5 COL
3294	V	V		V				RST SM 0402 47K PM5 COL
3295	V	V		V	V	V	V	RST SM 0402 100K PM5 COL
3296	V	V						RST SM 0402 100R PM5 COL
4206			V		V	V	V	RST SM 0805 JUMP. 0R05 COL R
4213	V	V						RST SM 0402 JUMP. 0R05 COL
4214	V	V						RST SM 0402 JUMP. 0R05 COL
4215	V	V						RST SM 0402 JUMP. 0R05 COL
5218	V	V		V				IND FXD 1206 EMI 100MHZ 120R R
6206	V	V						DIO SIG SM BAT54 SOD323 COL R
7208		V		V	V	V	V	TRA SIG SM BC847BW (COL) R
7209		V		V	V	V	V	TRA SIG SM BC847BW (COL) R
7210		V		V	V	V	V	TRA SIG SM BC847BW (COL) R
7217			V			V		IC SM TDA15011H/N1BD0 (PHSE) Y
7217	V	V		V	V		V	IC SM TDA15021H/N1B91 (PHSE) Y
7219	V	V		V				IC SM 74HC4053D (PHSE) R

B3 SYNC INTERFACE

Item	26/32PFxxxx - AP/NAFTA/LT	EU & AP DVB sets	LC4.3E/LC4.9x/LC4.8x/LC4.3A-China	26PF4310/10	Description
2449	V	V	V		CER2 0402 Y5V 16V 100N COL
3432		V			RST SM 0402 2K7 PM5 COL
3458	V	V	V		RST SM 0402 100R PM5 COL
3459	V	V	V		RST SM 0402 100R PM5 COL
3461	V	V	V		RST SM 0402 100R PM5 COL
3462	V	V	V		RST SM 0402 100R PM5 COL
4436				V	RST SM 0402 JUMP. 0R05 COL
4437				V	RST SM 0402 JUMP. 0R05 COL
4440	V	V	V		RST SM 0402 JUMP. 0R05 COL
4441	V	V	V		RST SM 0402 JUMP. 0R05 COL
6430	V		V	V	DIO REG SM PDZ2.4B (PHSE) R
6431	V		V	V	DIO SIG SM 1N4148WS (VISH) R
7436	V	V	V		IC SM 74LVC14APW (PHSE) R

B5 AUDIO WITHOUT AMPLIFIER

Item	26/32PF	37/42/50PF	Description
2612		V	CER2 0603 Y5V 10V 1U COL
2613	V		CER2 0603 Y5V 10V 1U COL
2616	V		CER2 0603 X5R 6V3 2U2 PM10 R
2617	V		CER2 0603 X5R 6V3 2U2 PM10 R
3615	V		RST SM 0402 10K PM5 COL
3616		V	RST SM 0402 1K PM5 COL
3617		V	RST SM 0402 1K PM5 COL
3618	V		RST SM 0402 22K PM5 COL
3619		V	RST SM 0402 10K PM5 COL
3620		V	RST SM 0402 10K PM5 COL
3623	V		RST SM 0402 47K PM5 COL
3625	V		RST SM 0402 3K3 PM5 COL
3627	V		RST SM 0402 22K PM5 COL
3628		V	RST SM 0402 10K PM5 COL
3629		V	RST SM 0402 22K PM5 COL
3630	V		RST SM 0402 330R PM5 COL
3630		V	RST SM 0402 470R PM5 COL
3631	V		RST SM 0402 330R PM5 COL
3631		V	RST SM 0402 470R PM5 COL
3632		V	RST SM 0402 RC31 39R PM5 R
3633		V	RST SM 0402 RC31 39R PM5 R
4601		V	RST SM 0603 JUMP. 0R05 COL
4602	V		RST SM 0603 JUMP. 0R05 COL
4603	V		RST SM 0603 JUMP. 0R05 COL
4606		V	RST SM 0603 JUMP. 0R05 COL
4609	V		RST SM 0603 JUMP. 0R05 COL
4610	V		RST SM 0603 JUMP. 0R05 COL
4611	V		RST SM 0603 JUMP. 0R05 COL
4612	V		RST SM 0603 JUMP. 0R05 COL
4613	V		RST SM 0603 JUMP. 0R05 COL
4614		V	RST SM 0603 JUMP. 0R05 COL
4615		V	RST SM 0603 JUMP. 0R05 COL
4616	V		RST SM 0603 JUMP. 0R05 COL
4617		V	RST SM 0603 JUMP. 0R05 COL
4618		V	RST SM 0603 JUMP. 0R05 COL
4619		V	RST SM 0603 JUMP. 0R05 COL
4620	V		RST SM 0603 JUMP. 0R05 COL
4621		V	RST SM 0603 JUMP. 0R05 COL
7603		V	TRA SIG SM BC847BW (COL) R
7604		V	TRA SIG SM BC847BW (COL) R
7607	V		TRA SIG SM BC847BW (COL) R

B6 DC DC CONVERTER

Item	26/32PF LCD	37/42PF LCD	42/50PF PDP	DVB PDP 42PF	DVB LCD 37PF	Description
2701	V	V			V	CER1 0402 NP0 50V 100P COL
2706		V	V	V	V	ELCAP SM 16V 10U PM20 COL R
2709		V	V	V	V	ELCAP SM 16V 47U PM20 COL R
2710		V	V	V	V	CER2 1210 Y5V 25V 10U P8020 R
2711		V	V	V	V	CER2 1210 Y5V 25V 10U P8020 R
2713		V	V	V	V	ELCAP SM SEV 16V 470U PM20 R
2714		V	V	V	V	CER2 0402 X7R 50V 220P COL
2715		V	V	V	V	CER2 0402 X7R 16V 22N PM10 R
2741		V	V	V	V	CER2 0603 X7R 10V 220N COL
2751	V	V			V	CER2 0402 Y5V 16V 100N COL
2752	V	V			V	ELCAP SM 16V 47U PM20 COL R
2760	V	V			V	CER2 1206 X7R 25V 1U PM10 R
2761		V	V	V	V	CER2 1206 X7R 25V 1U PM10 R
3708		V	V	V	V	RST SM 0402 10K PM5 COL
3709		V	V	V	V	RST SM 0402 6K8 PM5 COL
3712		V	V	V	V	RST SM 0603 RC22H 5K6 PM1 R
3713		V	V	V	V	RST SM 0603 RC22H 3K3 PM1 R
3716		V	V	V	V	RST SM 0402 4K7 PM5 COL
3740		V	V	V	V	RST SM 0402 1K5 PM5 COL
3741		V	V	V	V	RST SM 0402 1K5 PM5 COL
3742		V	V	V	V	RST SM 0402 15K PM5 COL
3743		V	V	V	V	RST SM 0402 22K PM5 COL
3755	V	V			V	RST SM 0402 10K PM5 COL
3758	V	V			V	RST SM 0402 15K PM5 COL
3760	V	V			V	RST SM 0402 100R PM5 COL
3761		V	V	V	V	RST SM 0402 100R PM5 COL
5700	V	V			V	IND FXD 1206 EMI 100MHZ 120R R
5704		V	V	V	V	IND FXD SM 1206 10U PM20 R
5709		V	V	V	V	IND FXD SM 7032 10U PM20 R
5712		V	V	V	V	IND FXD SM 12565 33U PM20 R
5713		V	V	V	V	INDFXD SM 10145 10U PM20 R
5756	V	V			V	IND FXD 1206 EMI 100MHZ 120R R
5757	V	V			V	IND FXD 1206 EMI 100MHZ 120R R
6708		V	V	V	V	DIO REC SS24 COL R
6709		V	V	V	V	DIO REC SS14 COL R
6712		V	V	V	V	DIO REC SS36 COL R
6740		V	V	V	V	DIO REG SM PDZ8.2B (PHSE) R
7708		V	V	V	V	IC SM LF33CPT (ST00) R
7710		V	V	V	V	IC SM E-L5973D (ST00) R
7741		V	V	V	V	TRA SIG SM BC847BW (COL) R
7742		V	V	V	V	TRA SIG SM BC847BW (COL) R
7754	V	V			V	FET POW SM SI2301BDS-E3(VISH)R
7755	V	V			V	TRA SIG SM PDTC114ET (COL) R

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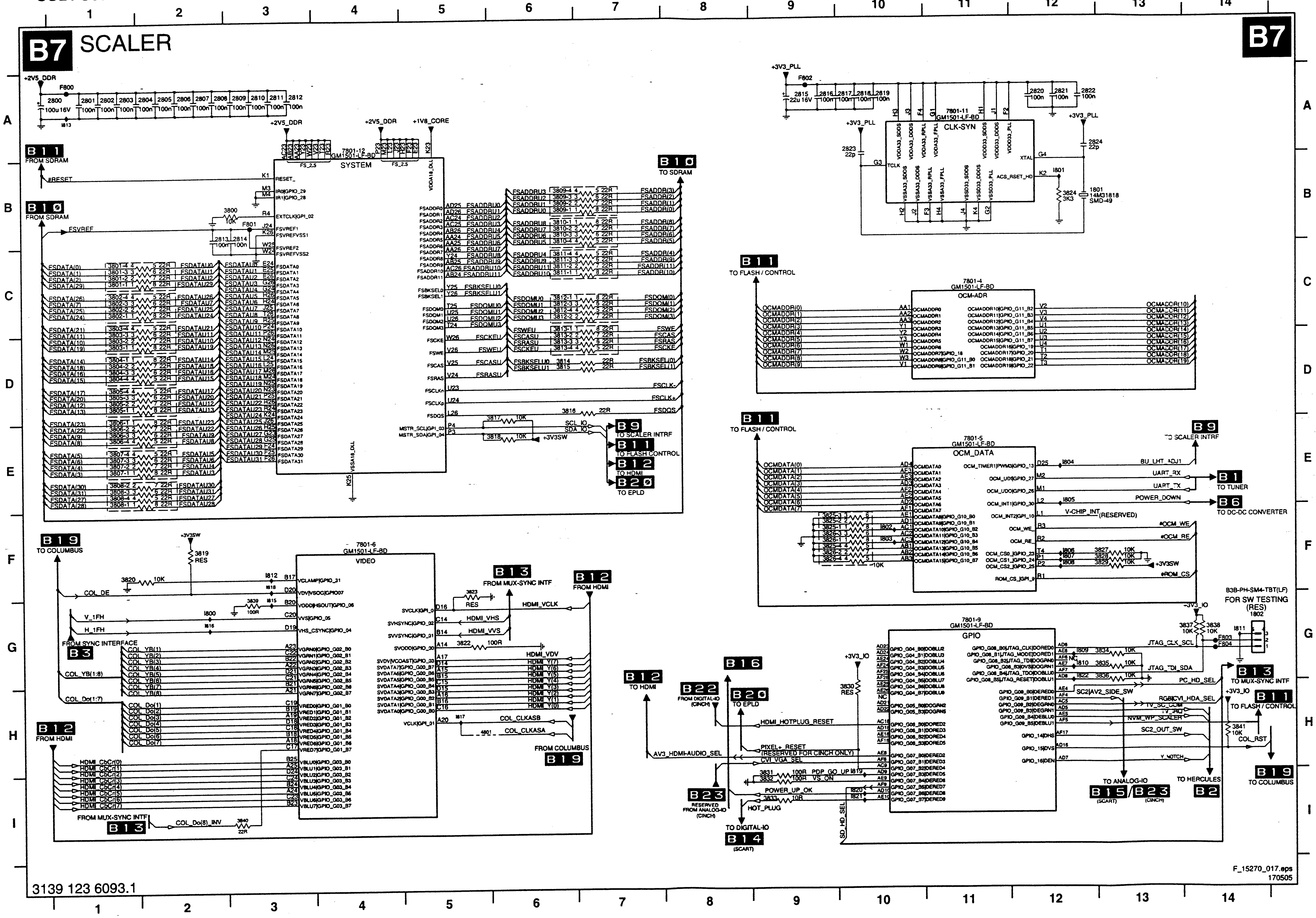
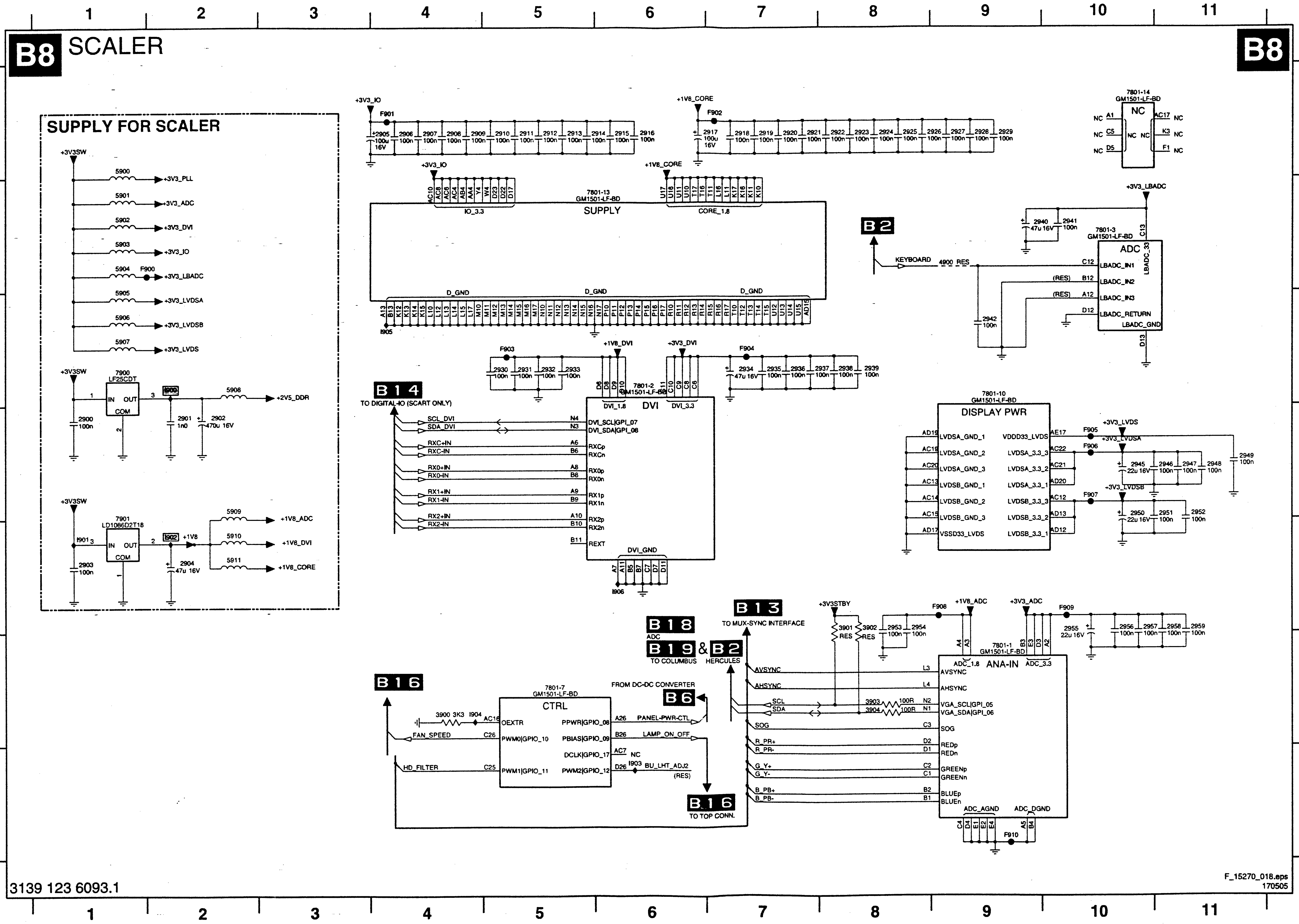
SSB: Scaler



B7 SCALER
B7
7801-12 GM1501-LF-BD SYSTEM
7801-11 GM1501-LF-BD CLK-SYN
7801-4 GM1501-LF-BD OCM-ADR
7801-5 GM1501-LF-BD OCM_DATA
7801-6 GM1501-LF-BD VIDEO
7801-9 GM1501-LF-BD GPIO
+2V5_DDR
+1V8_CORE
+3V3_PLL
+3V3SW
+3V3_IO
B11 FROM SDRAM
B10 FROM SDRAM
B10 TO SDRAM
B11 TO FLASH / CONTROL
B9 TO SCALER INTRF
B11 TO FLASH CONTROL
B12 TO HDMI
B20 TO EPLD
B1 TO TUNER
B6 TO DC-DC CONVERTER
B19 TO COLUMBUS
B13 FROM MUX-SYNC INTF
B12 FROM HDMI
B3 FROM SYNC INTERFACE
B19 FROM COLUMBUS
B12 FROM HDMI
B13 FROM MUX-SYNC INTF
B12 TO HDMI
B22 FROM DIGITAL-IO (CINCH)
B16
B20 TO EPLD
B23 RESERVED FROM ANALOG-IO (CINCH)
B14 TO DIGITAL-IO (SCART)
B15 / B23 TO ANALOG-IO (SCART) (CINCH)
B2 TO HERCULES
B13 TO MUX-SYNC INTF
B11 TO FLASH / CONTROL
B19 TO COLUMBUS
B3B-PH-SM4-TBT(LF) FOR SW TESTING (RES) 1802
HDMI_HOTPLUG_RESET
PIXEL+_RESET (RESERVED FOR CINCH ONLY)
CVI_VGA_SEL
POWER_UP_OK
HOT_PLUG
AV3_HDMI-AUDIO_SEL
SD_HD_SEL
BU_LHT_ADJ1
UART_RX
UART_TX
POWER_DOWN
V-CHIP_INT (RESERVED)
JTAG_CLK_SCL
JTAG_TDI_SDA
PC_HD_SEL
SC2_AV2_SIDE_SW
RGB_CVI_HDA_SEL
NVM_WP_SCALER
SC2_OUT_SW
COL_RST
COL_DE
V_1FH
H_1FH
COL_YB(1:8)
COL_Do(1:7)
COL_Do(8)_INV
COL_CLKASB
COL_CLKASA
HDMI_VCLK
HDMI_VHS
HDMI_VVS
HDMI_VDV
3139 123 6093.1
F_15270_017.eps 170505

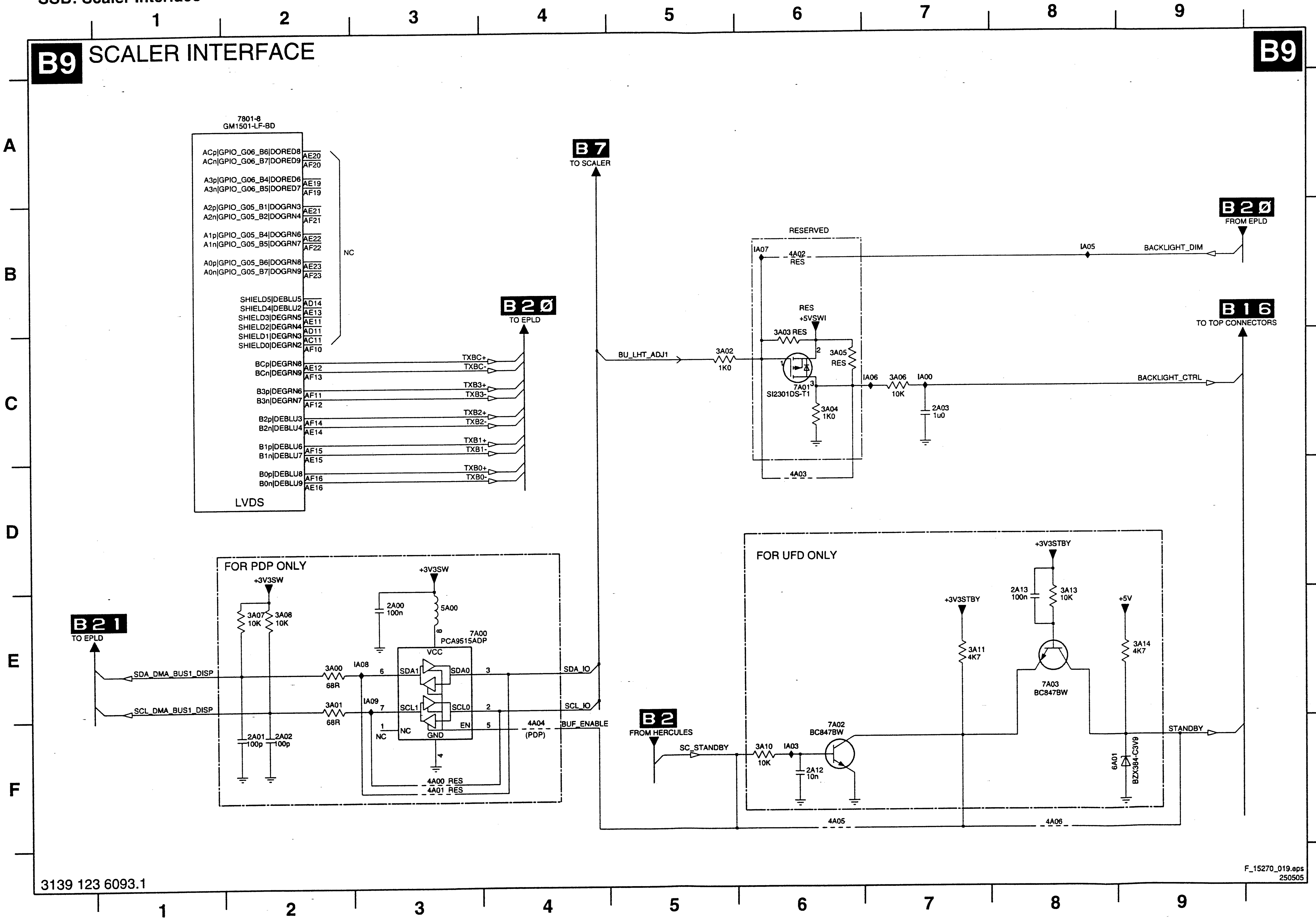
1801	B12
1802	G14
2800	A1
2801	A1
2802	A1
2803	A1
2804	A2
2805	A2
2806	A2
2807	A2
2808	A2
2809	A3
2810	A3
2811	A3
2812	A3
2813	B2
2814	B3
2815	A9
2816	A9
2817	A10
2818	A10
2819	A10
2820	A12
2821	A12
2822	A12
2823	A10
2824	A12
3800	B3
3801-1	C1
3801-2	C1
3801-3	C1
3801-4	C1
3802-1	C1
3802-2	C1
3802-3	C1
3802-4	C1
3803-1	D1
3803-2	D1
3803-3	C1
3803-4	C1
3804-1	D1
3804-2	D1
3804-3	D1
3804-4	D1
3805-1	D1
3805-2	D1
3805-3	D1
3805-4	D1
3806-1	D1
3806-2	E1
3806-3	E1
3806-4	E1
3807-1	E1
3807-2	E1
3807-3	E1
3807-4	E1
3808-1	E1
3808-2	E1
3808-3	E1
3808-4	E1
3809-1	B6
3809-2	B6
3809-3	B6
3809-4	B6
3810-1	B6
3810-2	B6
3810-3	B6
3810-4	B6
3811-1	C6
3811-2	C6
3811-3	C6
3811-4	C6
3812-1	C6
3812-2	C6
3812-3	C6
3812-4	C6
3813-1	C6
3813-2	D6
3813-3	D6
3813-4	D6
3814	D6
3815	D6
3816	D6
3817	D6
3818	E6
3819	F2
3820	F1
3822	G5
3823	F5
3824	B12
3825-1	F9
3825-2	F9
3825-3	F9
3825-4	F9
3826-1	F9
3826-2	F9
3826-3	F9
3826-4	F9
3827	F13
3828	F13
3829	F13
3830	H10
3831	I9
3832	I9
3833	I9
3834	G13
3835	G13
3836	G13
3837	G14
3838	G14
3839	G3
3840	I3
3841	H14
4801	H5
7801-11	A11
7801-12	A4
7801-4	C11
7801-5	E11
7801-6	F4
7801-9	G11
F800	A1
F801	B3
F802	A9
F803	G14
F804	G14
I800	G2
I801	B12
I802	F10
I803	F10
I804	E12
I805	E12
I806	F12
I807	F12
I808	F12
I809	G12
I810	G12
I811	G14
I812	F3
I813	A1
I815	G3
I816	G2
I817	H5
I818	F3
I819	I10
I820	I10
I821	I10
I822	G12

SSB: Scaler


1 2 3 4 5 6 7 8 9 10 11
A B C D E F G
B8
SCALER
SUPPLY FOR SCALER
+3V3SW
5900 +3V3_PLL
5901 +3V3_ADC
5902 +3V3_DVI
5903 +3V3_IO
5904 F900 +3V3_LBADC
5905 +3V3_LVDSA
5906 +3V3_LVDSB
5907 +3V3_LVDS
7900 LF25CDT
IN OUT COM
1 2 3
I900
2900 100n
2901 1n0
2902 470u 16V
5908 +2V5_DDR
7901 LD1086D2T18
I901
I902 +1V8
2903 100n
2904 47u 16V
5909 +1V8_ADC
5910 +1V8_DVI
5911 +1V8_CORE
+3V3_IO
F901
2905 100u 16V
2906 2907 2908 2909 2910 2911 2912 2913 2914 2915 2916 100n
+1V8_CORE
F902
2917 100u 16V
2918 2919 2920 2921 2922 2923 2924 2925 2926 2927 2928 2929 100n
AC10 AC8 AC6 AC4 AB4 AA4 Y4 W4 D23 D22 D17
IO_3.3
7801-13 GM1501-LF-BD
SUPPLY
U17 U16 U11 U10 T17 T16 T11 L16 L11 K17 K16 K11 K10
CORE_1.8
D_GND
A13 B13 K12 K13 K14 K15 L10 L12 L13 L14 L15 L17 M10 M11 M12 M13 M14 M15 M16 M17 N10 N11 N12 N13 N14 N15 N16 N17 P10 P11 P12 P13 P14 P15 P16 P17 R10 R11 R12 R13 R14 R15 R16 R17 T10 T12 T13 T14 T15 U12 U13 U14 U15 AD15
I905
7801-14 GM1501-LF-BD
NC
A1 C5 D5 AC17 K3 F1
B2
KEYBOARD
4900 RES
+3V3_LBADC
2940 47u 16V
2941 100n
7801-3 GM1501-LF-BD
ADC
C13 LBADC_33
C12 LBADC_IN1
(RES) B12 LBADC_IN2
(RES) A12 LBADC_IN3
D12 LBADC_RETURN
LBADC_GND D13
2942 100n
F903
2930 2931 2932 2933 100n
+1V8_DVI
+3V3_DVI
F904
2934 47u 16V
2935 2936 2937 2938 2939 100n
D6 D8 D9 D10 C11 C10 C9 C8 C6
7801-2 GM1501-LF-BD
DVI_1.8 DVI DVI_3.3
B14
TO DIGITAL-IO (SCART ONLY)
SCL_DVI N4 DVI_SCL|GPI_07
SDA_DVI N3 DVI_SDA|GPI_08
RXC+IN A6 RXCp
RXC-IN B6 RXCn
RX0+IN A8 RX0p
RX0-IN B8 RX0n
RX1+IN A9 RX1p
RX1-IN B9 RX1n
RX2+IN A10 RX2p
RX2-IN B10 RX2n
B11 REXT
DVI_GND
A7 A11 B5 B7 C7 D7 D11
I906
7801-10 GM1501-LF-BD
DISPLAY PWR
AD19 LVDSA_GND_1
AC19 LVDSA_GND_2
AC20 LVDSA_GND_3
AC13 LVDSB_GND_1
AC14 LVDSB_GND_2
AC15 LVDSB_GND_3
AD17 VSSD33_LVDS
VDDD33_LVDS AE17
LVDSA_3.3_3 AC22
LVDSA_3.3_2 AC21
LVDSA_3.3_1 AD20
LVDSB_3.3_3 AC12
LVDSB_3.3_2 AD13
LVDSB_3.3_1 AD12
F905 +3V3_LVDS
F906 +3V3_LVDSA
2945 22u 16V
2946 2947 2948 100n
2949 100n
F907 +3V3_LVDSB
2950 22u 16V
2951 2952 100n
B13
TO MUX-SYNC INTERFACE
B18
ADC
B19 & B2
TO COLUMBUS HERCULES
B16
7801-7 GM1501-LF-BD
CTRL
3900 3K3 I904 AC16 OEXTR
FAN_SPEED C26 PWM0|GPIO_10
HD_FILTER C25 PWM1|GPIO_11
PPWR|GPIO_08 A26 PANEL-PWR-CTL
PBIAS|GPIO_09 B26 LAMP_ON_OFF
DCLK|GPIO_17 AC7 NC
PWM2|GPIO_12 D26 I903 BU_LHT_ADJ2 (RES)
FROM DC-DC CONVERTER
B6
B16
TO TOP CONN.
+3V3STBY
3901 RES
3902 RES
2953 2954 100n
F908 +1V8_ADC
+3V3_ADC F909
2955 22u 16V
2956 2957 2958 2959 100n
A4 A3 B3 E3 D3 A2
7801-1 GM1501-LF-BD
ADC_1.8 ANA-IN ADC_3.3
AVSYNC L3 AVSYNC
AHSYNC L4 AHSYNC
SCL 3903 100R N2 VGA_SCL|GPI_05
SDA 3904 100R N1 VGA_SDA|GPI_06
SOG C3 SOG
R_PR+ D2 REDp
R_PR- D1 REDn
G_Y+ C2 GREENp
G_Y- C1 GREENn
B_PB+ B2 BLUEp
B_PB- B1 BLUEn
ADC_AGND ADC_DGND
C4 D4 E1 E2 E4 A5 B4
F910
3139 123 6093.1
F_15270_018.eps
170505

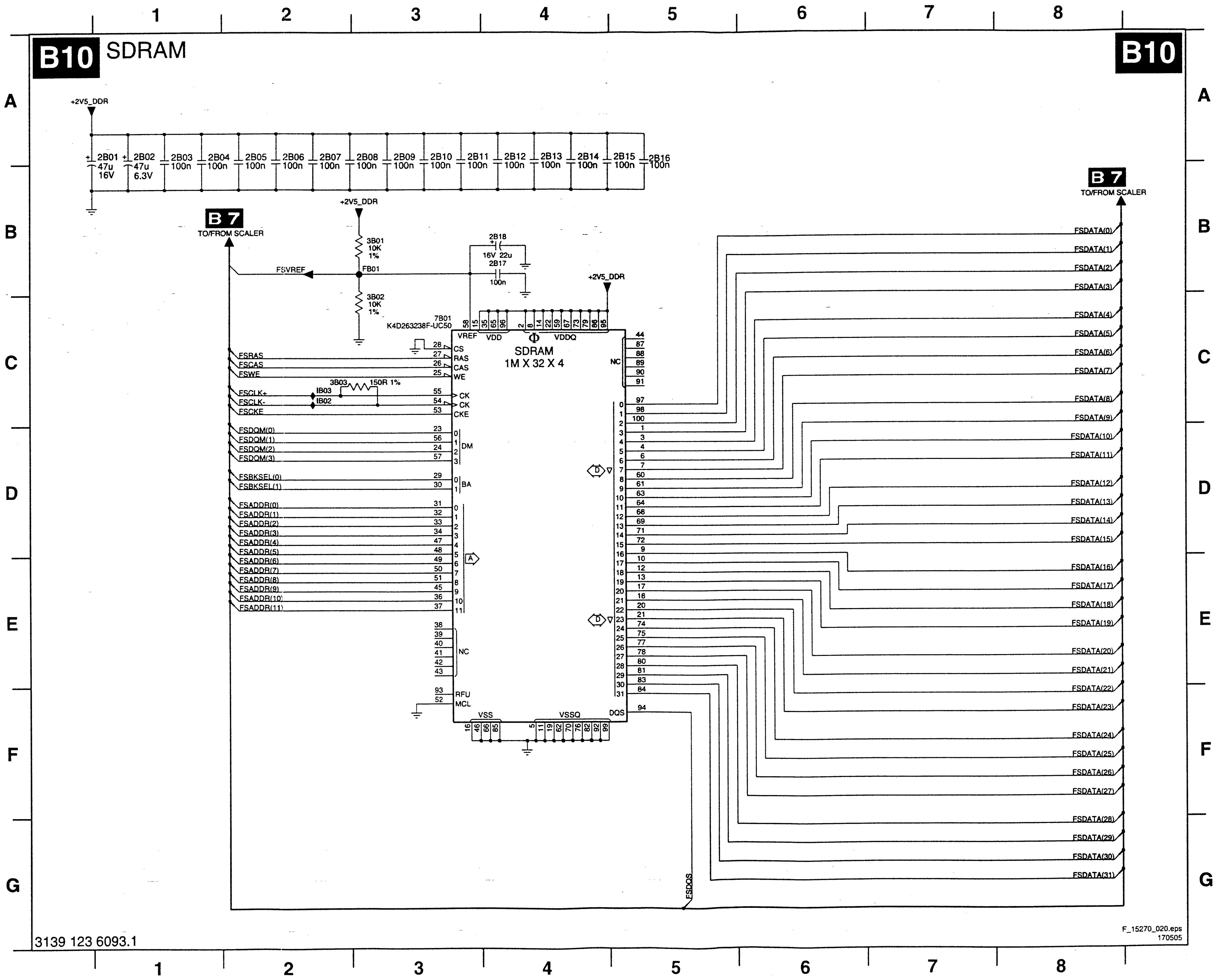
2900	D1
2901	D2
2902	D2
2903	E1
2904	E2
2905	A4
2906	A4
2907	A4
2908	A4
2909	A4
2910	A5
2911	A5
2912	A5
2913	A5
2914	A6
2915	A6
2916	A6
2917	A7
2918	A7
2919	A7
2920	A7
2921	A7
2922	A8
2923	A8
2924	A8
2925	A8
2926	A9
2927	A9
2928	A9
2929	A9
2930	C5
2931	C5
2932	C5
2933	C5
2934	C7
2935	C7
2936	C7
2937	C8
2938	C8
2939	C8
2940	B9
2941	B10
2942	C9
2945	D10
2946	D11
2947	D11
2948	D11
2949	D11
2950	D10
2951	D11
2952	D11
2953	E8
2954	E8
2955	E10
2956	E10
2957	E10
2958	E11
2959	E11
3900	F4
3901	E8
3902	E8
3903	F8
3904	F8
4900	B9
5900	A1
5901	B1
5902	B1
5903	B1
5904	B1
5905	C1
5906	C1
5907	C1
5908	C2
5909	D2
5910	E2
5911	E2
7801-1	F9
7801-10	C9
7801-13	B6
7801-14	A10
7801-2	C6
7801-3	B10
7801-7	F5
7900	C1
7901	D1
F900	B2
F901	A4
F902	A7
F903	C5
F904	C7
F905	D10
F906	D10
F907	D10
F908	E9
F909	E10
F910	G9
I900	C2
I901	E1
I902	E2
I903	G6
I904	F4
I905	C4
I906	E6

SSB: Scaler Interface


B9 SCALER INTERFACE
B9
1 2 3 4 5 6 7 8 9
A B C D E F
7801-8
GM1501-LF-BD
ACp|GPIO_G06_B6|DORED8 AE20
ACn|GPIO_G06_B7|DORED9 AF20
A3p|GPIO_G06_B4|DORED6 AE19
A3n|GPIO_G06_B5|DORED7 AF19
A2p|GPIO_G05_B1|DOGRN3 AE21
A2n|GPIO_G05_B2|DOGRN4 AF21
A1p|GPIO_G05_B4|DOGRN6 AE22
A1n|GPIO_G05_B5|DOGRN7 AF22
A0p|GPIO_G05_B6|DOGRN8 AE23
A0n|GPIO_G05_B7|DOGRN9 AF23
NC
SHIELD5|DEBLU5 AD14
SHIELD4|DEBLU2 AE13
SHIELD3|DEGRN5 AE11
SHIELD2|DEGRN4 AD11
SHIELD1|DEGRN3 AC11
SHIELD0|DEGRN2 AF10
BCp|DEGRN8 AE12
BCn|DEGRN9 AF13
B3p|DEGRN6 AF11
B3n|DEGRN7 AF12
B2p|DEBLU3 AF14
B2n|DEBLU4 AE14
B1p|DEBLU6 AF15
B1n|DEBLU7 AE15
B0p|DEBLU8 AF16
B0n|DEBLU9 AE16
LVDS
TXBC+
TXBC-
TXB3+
TXB3-
TXB2+
TXB2-
TXB1+
TXB1-
TXB0+
TXB0-
B20 TO EPLD
B7 TO SCALER
BU_LHT_ADJ1
3A02 1K0
RESERVED
IA07
4A02 RES
IA05
BACKLIGHT_DIM
B20 FROM EPLD
RES +5VSWI
3A03 RES
3A05 RES
7A01 SI2301DS-T1
3A04 1K0
IA06
3A06 10K
IA00
2A03 1u0
BACKLIGHT_CTRL
B16 TO TOP CONNECTORS
4A03
FOR PDP ONLY
+3V3SW
3A07 10K
3A08 10K
+3V3SW
2A00 100n
5A00
7A00 PCA9515ADP
VCC
B21 TO EPLD
SDA_DMA_BUS1_DISP
SCL_DMA_BUS1_DISP
3A00 68R
IA08
3A01 68R
IA09
SDA1
SDA0
SCL1
SCL0
NC
GND
EN
SDA_IO
SCL_IO
4A04 (PDP)
BUF_ENABLE
2A01 100p
2A02 100p
4A00 RES
4A01 RES
FOR UFD ONLY
+3V3STBY
2A13 100n
3A13 10K
+3V3STBY
3A11 4K7
+5V
3A14 4K7
7A03 BC847BW
B2 FROM HERCULES
SC_STANDBY
3A10 10K
IA03
2A12 10n
7A02 BC847BW
6A01 BZX384-C3V9
STANDBY
4A05
4A06
F_15270_019.eps 250505
3139 123 6093.1

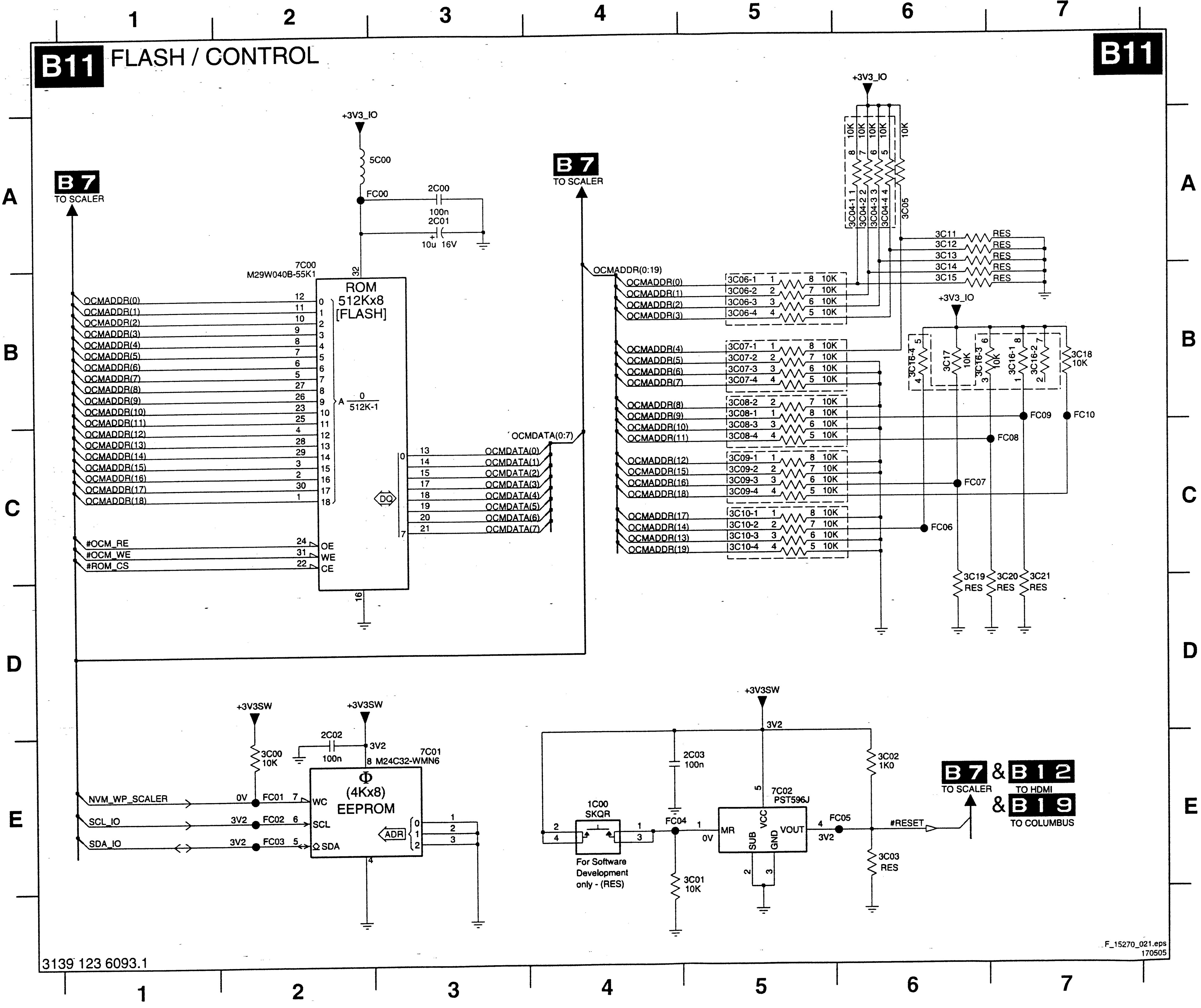
2A00	E3
2A01	F2
2A02	F2
2A03	C7
2A12	F6
2A13	E8
3A00	E2
3A01	E2
3A02	C5
3A03	C6
3A04	C6
3A05	C6
3A06	C7
3A07	E2
3A08	E2
3A10	F6
3A11	E7
3A13	E8
3A14	E9
4A00	F3
4A01	F3
4A02	B6
4A03	D6
4A04	F4
4A05	F6
4A06	F8
5A00	E3
6A01	F8
7801-8	A2
7A00	E4
7A01	C6
7A02	F6
7A03	E8
IA00	C7
IA03	F6
IA05	B8
IA06	C7
IA07	B6
IA08	E3
IA09	E3

SSB: SDRAM


B10
SDRAM
+2V5_DDR
2B01 47u 16V
2B02 47u 6.3V
2B03 100n
2B04 100n
2B05 100n
2B06 100n
2B07 100n
2B08 100n
2B09 100n
2B10 100n
2B11 100n
2B12 100n
2B13 100n
2B14 100n
2B15 100n
2B16 100n
B7 TO/FROM SCALER
3B01 10K 1%
3B02 10K 1%
FB01
FSVREF
2B18 16V 22u
2B17 100n
7B01 K4D263238F-UC50
VREF VDD VDDQ
SDRAM 1M X 32 X 4
NC
CS RAS CAS WE CK CK CKE
FSRAS
FSCAS
FSWE
3B03 150R 1%
IB03
IB02
FSCLK+
FSCLK-
FSCKE
FSDQM(0)
FSDQM(1)
FSDQM(2)
FSDQM(3)
DM
FSBKSEL(0)
FSBKSEL(1)
BA
FSADDR(0)
FSADDR(1)
FSADDR(2)
FSADDR(3)
FSADDR(4)
FSADDR(5)
FSADDR(6)
FSADDR(7)
FSADDR(8)
FSADDR(9)
FSADDR(10)
FSADDR(11)
A
D
RFU
MCL
VSS
VSSQ
DQS
FSDQS
FSDATA(0)
FSDATA(1)
FSDATA(2)
FSDATA(3)
FSDATA(4)
FSDATA(5)
FSDATA(6)
FSDATA(7)
FSDATA(8)
FSDATA(9)
FSDATA(10)
FSDATA(11)
FSDATA(12)
FSDATA(13)
FSDATA(14)
FSDATA(15)
FSDATA(16)
FSDATA(17)
FSDATA(18)
FSDATA(19)
FSDATA(20)
FSDATA(21)
FSDATA(22)
FSDATA(23)
FSDATA(24)
FSDATA(25)
FSDATA(26)
FSDATA(27)
FSDATA(28)
FSDATA(29)
FSDATA(30)
FSDATA(31)
1 2 3 4 5 6 7 8
A B C D E F G
3139 123 6093.1
F_15270_020.eps
170505

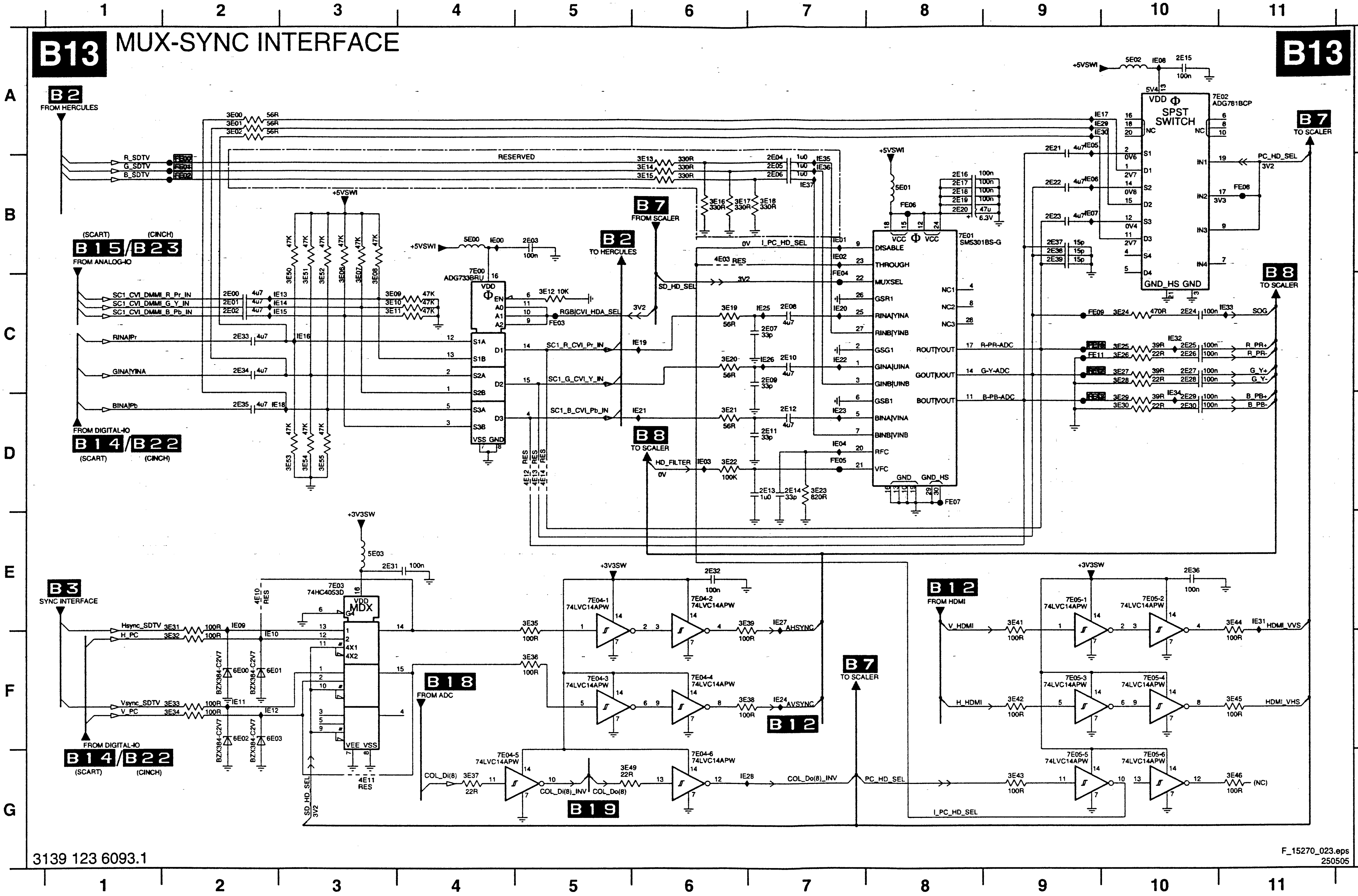
2B01	A1
2B02	A1
2B03	A1
2B04	A1
2B05	A2
2B06	A2
2B07	A2
2B08	A3
2B09	A3
2B10	A3
2B11	A3
2B12	A4
2B13	A4
2B14	A4
2B15	A5
2B16	A5
2B17	B4
2B18	B4
3B01	B3
3B02	B3
3B03	C2
7B01	C3
FB01	B3
IB02	C2
IB03	C2

SSB: Flash / Control


B11 FLASH / CONTROL
B11
1 2 3 4 5 6 7
A B C D E
B 7 TO SCALER
+3V3_IO
5C00
FC00
2C00 100n
2C01 10u 16V
7C00 M29W040B-55K1
ROM 512Kx8 [FLASH]
A 0 / 512K-1
OCMADDR(0) … OCMADDR(18)
OCMDATA(0:7)
OCMDATA(0) … OCMDATA(7)
#OCM_RE OE
#OCM_WE WE
#ROM_CS CE
OCMADDR(0:19)
3C04-1 3C04-2 3C04-3 3C04-4 3C05 10K
3C06-1 3C06-2 3C06-3 3C06-4 10K
3C07-1 3C07-2 3C07-3 3C07-4 10K
3C08-1 3C08-2 3C08-3 3C08-4 10K
3C09-1 3C09-2 3C09-3 3C09-4 10K
3C10-1 3C10-2 3C10-3 3C10-4 10K
3C11 3C12 3C13 3C14 3C15 RES
3C16-1 3C16-2 3C16-3 3C16-4 3C17 10K
3C18 10K
3C19 RES 3C20 RES 3C21 RES
FC06 FC07 FC08 FC09 FC10
+3V3SW
3C00 10K
2C02 100n
3V2
7C01 M24C32-WMN6
(4Kx8) EEPROM
WC SCL SDA ADR
NVM_WP_SCALER 0V FC01
SCL_IO 3V2 FC02
SDA_IO 3V2 FC03
2C03 100n
1C00 SKQR
For Software Development only - (RES)
FC04 0V
3C01 10K
7C02 PST596J
MR VCC VOUT SUB GND
FC05 3V2
3C02 1K0
3C03 RES
#RESET
B 7 TO SCALER & B 1 2 TO HDMI & B 1 9 TO COLUMBUS
3139 123 6093.1
F_15270_021.eps 170505

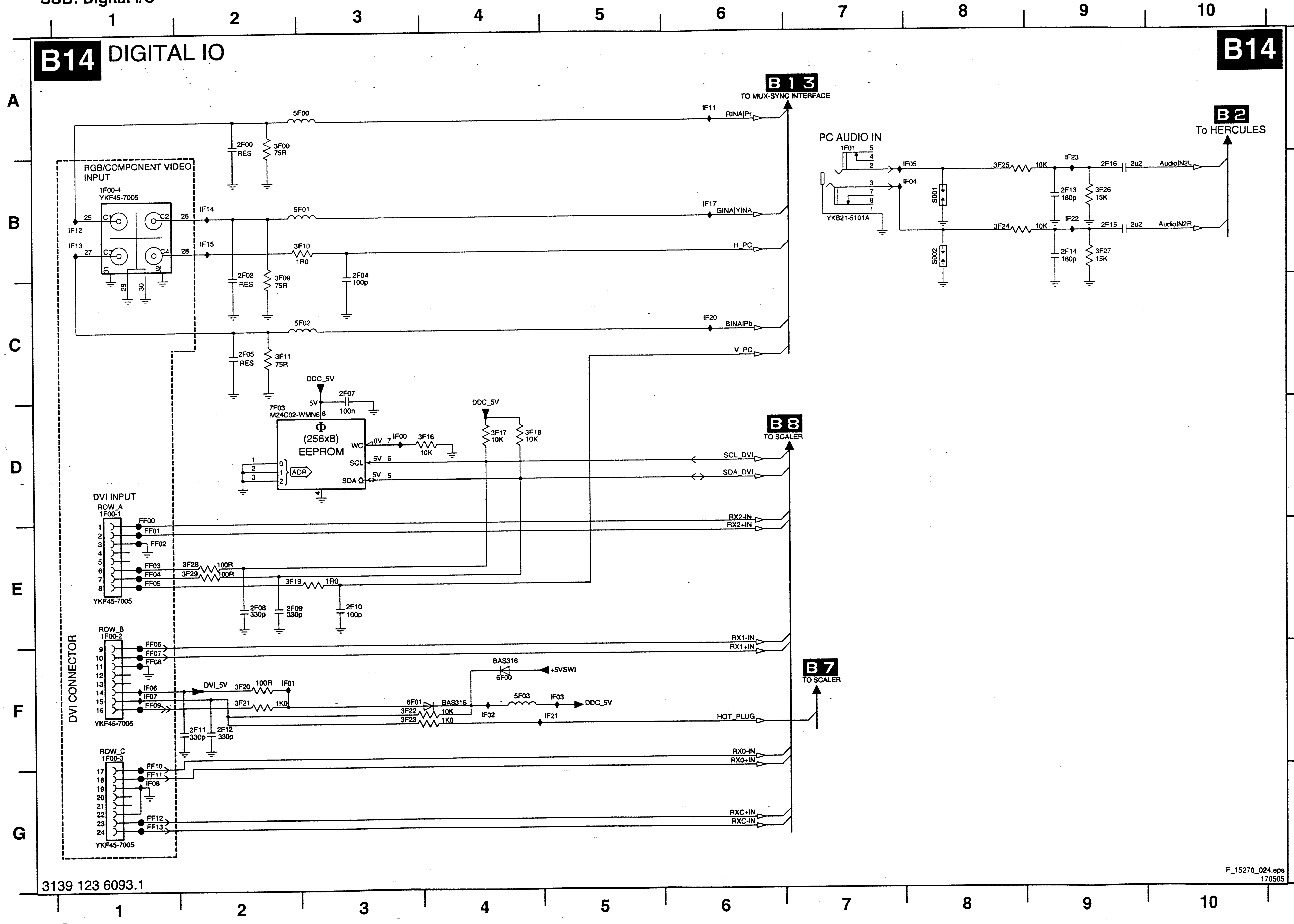
1C00	E4
2C00	A3
2C01	A3
2C02	E2
2C03	E5
3C00	E2
3C01	E5
3C02	E6
3C03	E6
3C04-1	A6
3C04-2	A6
3C04-3	A6
3C04-4	A6
3C05	A6
3C06-1	B5
3C06-2	B5
3C06-3	B5
3C06-4	B5
3C07-1	B5
3C07-2	B5
3C07-3	B5
3C07-4	B5
3C08-1	B5
3C08-2	B5
3C08-3	C5
3C08-4	C5
3C09-1	C5
3C09-2	C5
3C09-3	C5
3C09-4	C5
3C10-1	C5
3C10-2	C5
3C10-3	C5
3C10-4	C5
3C11	A6
3C12	A6
3C13	A6
3C14	B6
3C15	B6
3C16-1	B7
3C16-2	B7
3C16-3	B6
3C16-4	B6
3C17	B6
3C18	B7
3C19	C6
3C20	C7
3C21	C7
5C00	A3
7C00	A2
7C01	E3
7C02	E5
FC00	A3
FC01	E2
FC02	E2
FC03	E2
FC04	E4
FC05	E6
FC06	C6
FC07	C6
FC08	C7
FC09	B7
FC10	B7

SSB: MUX-Sync Interface


B13 MUX-SYNC INTERFACE
B13
B2 FROM HERCULES
R_SDTV
G_SDTV
B_SDTV
RESERVED
B15/B23 (SCART) (CINCH) FROM ANALOG-IO
SC1_CVI_DMMI_R_Pr_IN
SC1_CVI_DMMI_G_Y_IN
SC1_CVI_DMMI_B_Pb_IN
RINA|Pr
GINA|YINA
BINA|Pb
FROM DIGITAL-IO
B14/B22 (SCART) (CINCH)
+5VSWI
7E00 ADG733BRU
RGB|CVI_HDA_SEL
SC1_R_CVI_Pr_IN
SC1_G_CVI_Y_IN
SC1_B_CVI_Pb_IN
B7 FROM SCALER
B2 TO HERCULES
SD_HD_SEL
I_PC_HD_SEL
HD_FILTER
B8 TO SCALER
7E01 SM5301BS-G
DISABLE
THROUGH
MUXSEL
GSR1
RINA|YINA
RINB|YINB
GSG1
GINA|UINA
GINB|UINB
GSB1
BINA|VINA
BINB|VINB
RFC
VFC
ROUT|YOUT
GOUT|UOUT
BOUT|VOUT
R-PR-ADC
G-Y-ADC
B-PB-ADC
7E02 ADG781BCP
SPST SWITCH
PC_HD_SEL
B7 TO SCALER
B8 TO SCALER
SOG
R_PR+
R_PR-
G_Y+
G_Y-
B_PB+
B_PB-
+3V3SW
B3 SYNC INTERFACE
Hsync_SDTV
H_PC
Vsync_SDTV
V_PC
7E03 74HC4053D
MDX
B18 FROM ADC
7E04-1 74LVC14APW
7E04-2 74LVC14APW
7E04-3 74LVC14APW
7E04-4 74LVC14APW
7E04-5 74LVC14APW
7E04-6 74LVC14APW
AHSYNC
AVSYNC
B12
COL_Di(8)
COL_Di(8)_INV
COL_Do(8)
COL_Do(8)_INV
B19
B7 TO SCALER
B12 FROM HDMI
V_HDMI
H_HDMI
7E05-1 74LVC14APW
7E05-2 74LVC14APW
7E05-3 74LVC14APW
7E05-4 74LVC14APW
7E05-5 74LVC14APW
7E05-6 74LVC14APW
HDMI_VVS
HDMI_VHS
(NC)
PC_HD_SEL
I_PC_HD_SEL
3139 123 6093.1
F_15270_023.eps 250505

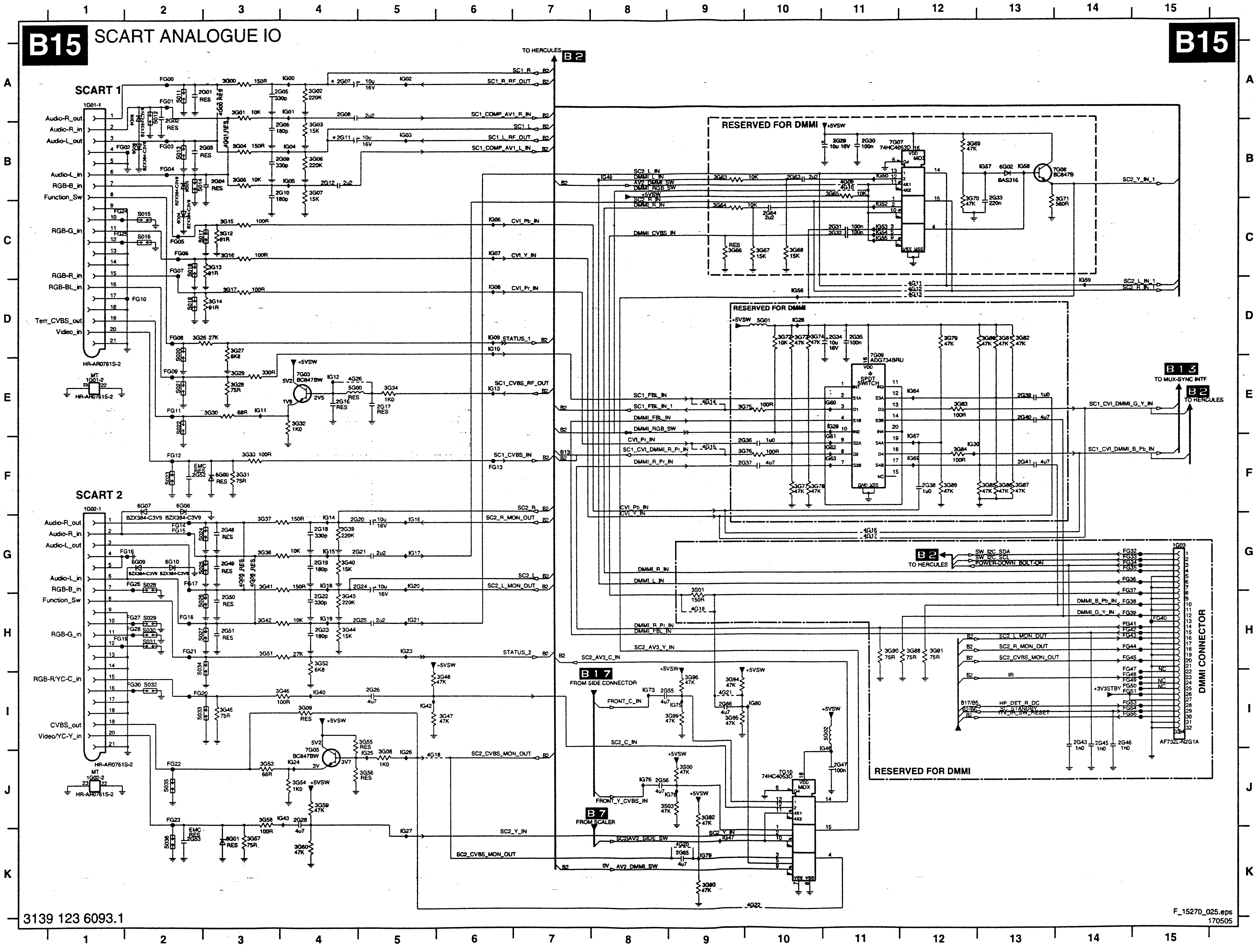
2E00	C2
2E01	C2
2E02	C2
2E03	B5
2E04	B7
2E05	B7
2E06	B7
2E07	C7
2E08	C7
2E09	C7
2E10	C7
2E11	D7
2E12	D7
2E13	D7
2E14	D7
2E15	A10
2E16	B8
2E17	B8
2E18	B8
2E19	B8
2E20	B8
2E21	A9
2E22	B9
2E23	B9
2E24	C10
2E25	C10
2E26	C10
2E27	C10
2E28	C10
2E29	D10
2E30	D10
2E31	E3
2E32	E6
2E33	C2
2E34	C2
2E35	D2
2E36	E10
2E37	B9
2E38	B9
2E39	B9
3E00	A2
3E01	A2
3E02	A2
3E06	C3
3E07	C3
3E08	C3
3E09	C3
3E10	C3
3E11	C3
3E12	C5
3E13	B6
3E14	B6
3E15	B6
3E16	B6
3E17	B6
3E18	B7
3E19	C6
3E20	C6
3E21	D6
3E22	D6
3E23	D7
3E24	C10
3E25	C10
3E26	C10
3E27	C10
3E28	C10
3E29	D10
3E30	D10
3E31	E2
3E32	F2
3E33	F2
3E34	F2
3E35	E5
3E36	F5
3E37	G4
3E38	F6
3E39	E6
3E41	E9
3E42	F9
3E43	G9
3E44	E11
3E45	F11
3E46	G11
3E49	G5
3E50	C3
3E51	C3
3E52	C3
3E53	D3
3E54	D3
3E55	D3
4E03	B6
4E10	E2
4E11	G3
4E12	D5
4E13	D5
4E14	D5
5E00	B4
5E01	B8
5E02	A10
5E03	E3
6E00	F2
6E01	F2
6E02	F2
6E03	F2
7E00	B4
7E01	B8
7E02	A10
7E03	E3
7E04-1	E5
7E04-2	E6
7E04-3	F5
7E04-4	F6
7E04-5	G5
7E04-6	G6
7E05-1	E9
7E05-2	E10
7E05-3	F9
7E05-4	F10
7E05-5	G9
7E05-6	G10
FE00	B2
FE01	B2
FE02	B2
FE03	C5
FE04	C7
FE05	D7
FE06	B8
FE07	D8
FE08	B11
FE09	C9
FE10	C9
FE11	C9
FE12	C9
FE13	D9
IE00	B4
IE01	B7
IE02	B7
IE03	D6
IE04	D7
IE05	A9
IE06	B9
IE07	B9
IE08	A10
IE09	E2
IE10	F2
IE11	F2
IE12	F2
IE13	C3
IE14	C3
IE15	C3
IE16	C3
IE17	A10
IE18	D2
IE19	C6
IE20	C7
IE21	D6
IE22	C7
IE23	D7
IE24	F7
IE25	C7
IE26	C7
IE27	E7
IE28	G6
IE29	A10
IE30	A10
IE31	E11
IE32	C10
IE33	C11
IE34	D10
IE35	B7
IE36	B7
IE37	B7

SSB: Digital I/O


B14
DIGITAL IO
B14
B13
TO MUX-SYNC INTERFACE
B2
To HERCULES
B8
TO SCALER
B7
TO SCALER
RGB/COMPONENT VIDEO INPUT
1F00-4
YKF45-7005
PC AUDIO IN
1F01
YKB21-5101A
DVI INPUT
ROW_A
1F00-1
ROW_B
1F00-2
ROW_C
1F00-3
YKF45-7005
DVI CONNECTOR
7F03
M24C02-WMN6
(256x8)
EEPROM
WC
SCL
SDA
ADR
DDC_5V
2F07
100n
3F16
10K
3F17
10K
3F18
10K
5F00
5F01
5F02
5F03
3F00
75R
3F09
75R
3F11
75R
3F10
1R0
2F00
RES
2F02
RES
2F05
RES
2F04
100p
RINA|Pr
GINA|YINA
H_PC
BINA|Pb
V_PC
SCL_DVI
SDA_DVI
RX2-IN
RX2+IN
RX1-IN
RX1+IN
RX0-IN
RX0+IN
RXC+IN
RXC-IN
HOT_PLUG
3F28 100R
3F29 100R
3F19 1R0
2F08 330p
2F09 330p
2F10 100p
BAS316
6F00
+5VSWI
DVI_5V
3F20 100R
3F21 1K0
6F01
BAS316
3F22 10K
3F23 1K0
2F11 330p
2F12 330p
DDC_5V
3F25 10K
3F24 10K
2F13 180p
2F14 180p
3F26 15K
3F27 15K
2F16 2u2
2F15 2u2
AudioIN2L
AudioIN2R
S001
S002
IF00
IF01
IF02
IF03
IF04
IF05
IF06
IF07
IF08
IF11
IF12
IF13
IF14
IF15
IF17
IF20
IF21
IF22
IF23
FF00
FF01
FF02
FF03
FF04
FF05
FF06
FF07
FF08
FF09
FF10
FF11
FF12
FF13
3139 123 6093.1
F_15270_024.eps
170505

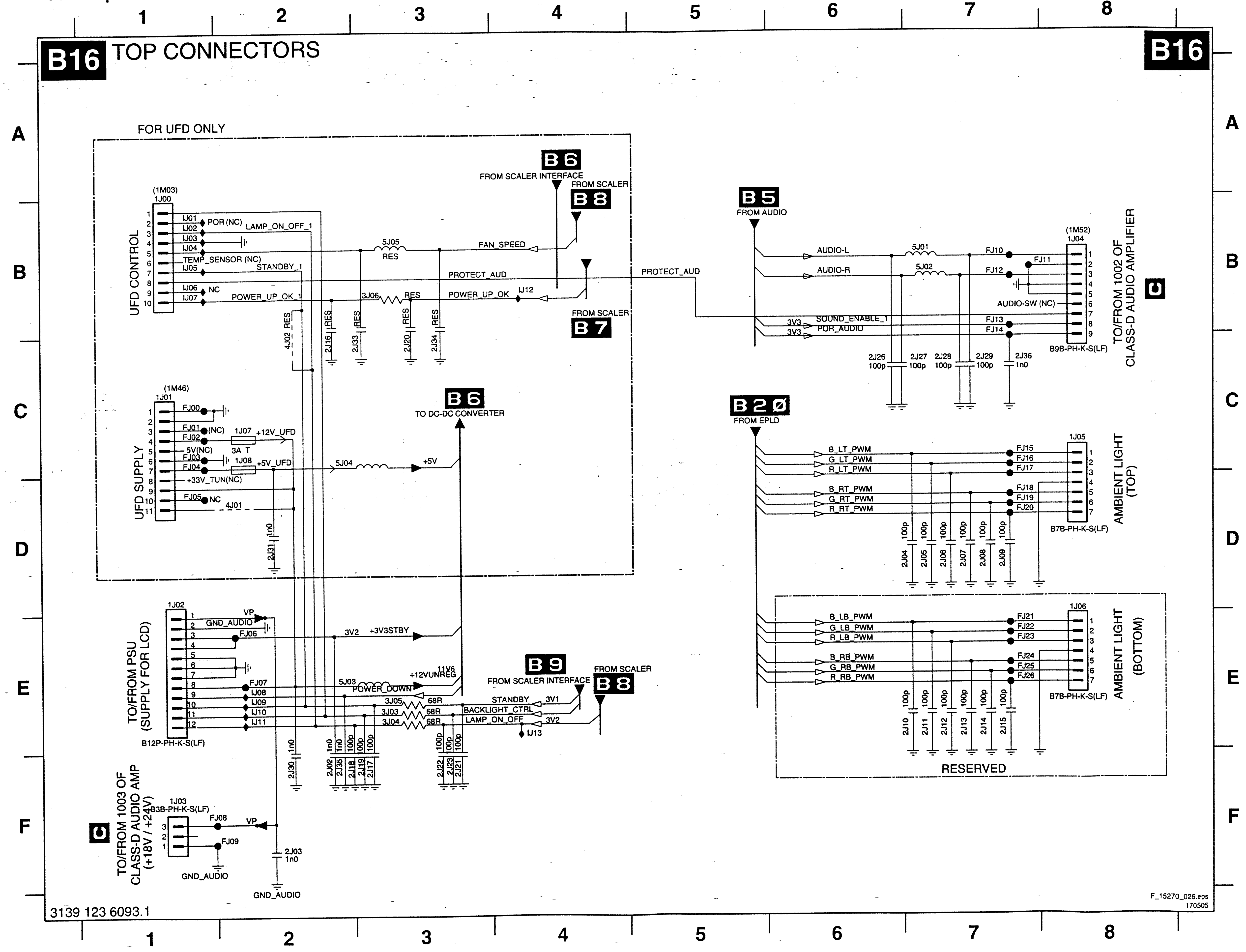
1F00-1	D1
1F00-2	E1
1F00-3	F1
1F00-4	B1
1F01	A7
2F00	A2
2F02	B2
2F04	B3
2F05	C2
2F07	C3
2F08	E2
2F09	E2
2F10	E3
2F11	F2
2F12	F2
2F13	B9
2F14	B9
2F15	B9
2F16	B9
3F00	A2
3F09	B2
3F10	B3
3F11	C2
3F16	D4
3F17	D4
3F18	D4
3F19	E2
3F20	F2
3F21	F2
3F22	F3
3F23	F3
3F24	B8
3F25	B8
3F26	B9
3F27	B9
3F28	E2
3F29	E2
5F00	A3
5F01	B3
5F02	C3
5F03	F4
6F00	F4
6F01	F3
7F03	D2
FF00	D1
FF01	E1
FF02	E1
FF03	E1
FF04	E1
FF05	E1
FF06	E1
FF07	F1
FF08	F1
FF09	F1
FF10	F1
FF11	G1
FF12	G1
FF13	G1
IF00	D3
IF01	F2
IF02	F4
IF03	F5
IF04	B8
IF05	B8
IF06	F1
IF07	F1
IF08	G1
IF11	A6
IF12	B1
IF13	B1
IF14	B2
IF15	B2
IF17	B6
IF20	C6
IF21	F5
IF22	B9
IF23	B9
S001	B8
S002	B8

SSB: SCART Analogue I/O


B15
SCART ANALOGUE IO
B15
SCART 1
SCART 2
Audio-R_out
Audio-R_in
Audio-L_out
Audio-L_in
RGB-B_in
Function_Sw
RGB-G_in
RGB-R_in
RGB-BL_in
Terr_CVBS_out
Video_in
RGB-R/YC-C_in
CVBS_out
Video/YC-Y_in
HR-AR0761S-2
TO HERCULES
RESERVED FOR DMMI
7G07 74HC4053D
7G08 BC847B
7G09 ADG734BRU
SPDT SWITCH
7G10 74HC4053D
7G03 BC847BW
7G05 BC847BW
SC1_R
SC1_R_RF_OUT
SC1_COMP_AV1_R_IN
SC1_L
SC1_L_RF_OUT
SC1_COMP_AV1_L_IN
SC2_L_IN
DMMI_L_IN
AV2_DMMI_SW
DMMI_RGB_SW
SC2_R_IN
DMMI_CVBS_IN
SC2_Y_IN_1
CVI_Pb_IN
CVI_Y_IN
CVI_Pr_IN
STATUS_1
SC1_CVBS_RF_OUT
SC1_FBL_IN
SC1_FBL_IN_1
DMMI_FBL_IN
DMMI_RGB_SW
CVI_Pr_IN
SC1_CVI_DMMI_R_Pr_IN
DMMI_R_Pr_IN
SC1_CVI_DMMI_G_Y_IN
SC1_CVI_DMMI_B_Pb_IN
TO MUX-SYNC INTF
SC1_CVBS_IN
SC2_R
SC2_R_MON_OUT
SC2_L
SC2_L_MON_OUT
STATUS_2
SC2_AV3_C_IN
SC2_AV3_Y_IN
SC2_CVBS_MON_OUT
SC2_Y_IN
SC2_C_IN
FRONT_C_IN
FRONT_Y_CVBS_IN
SC2/AV2_SIDE_SW
AV2_DMMI_SW
FROM SIDE CONNECTOR
FROM SCALER
SW_I2C_SDA
SW_I2C_SCL
POWER-DOWN_BOLT-ON
DMMI_R_IN
DMMI_L_IN
DMMI_B_Pb_IN
DMMI_G_Y_IN
DMMI_R_Pr_IN
DMMI_FBL_IN
SC2_L_MON_OUT
SC2_R_MON_OUT
SC2_CVBS_MON_OUT
IR
+3V3STBY
HP_DET_R_DC
SC_STANDBY
ITV_IR_SW_RESET
DMMI CONNECTOR
AF732L-N2G1A
+5VSW
3139 123 6093.1
F_15270_025.eps
170505

1G01-1	A1
1G01-2	E1
1G02-1	F1
1G02-2	J1
1G03	G15
2G01	A3
2G02	A2
2G03	B3
2G04	B3
2G05	A3
2G06	B3
2G07	A4
2G08	A4
2G09	B3
2G10	B3
2G11	B4
2G12	B4
2G16	E4
2G17	E5
2G18	G4
2G19	G4
2G20	G5
2G21	G4
2G22	H4
2G23	H4
2G24	G5
2G25	H4
2G26	I5
2G28	J4
2G29	B11
2G30	B11
2G31	C11
2G32	C11
2G33	C13
2G34	D11
2G35	D11
2G36	F9
2G37	F9
2G38	F12
2G39	E13
2G40	E13
2G41	F13
2G43	I14
2G45	I14
2G46	I14
2G47	J11
2G48	G3
2G49	G3
2G50	H3
2G51	H3
2G52	F2
2G53	K2
2G55	I8
2G56	J8
2G63	B10
2G64	C10
2G65	K9
2G66	I9
3G00	A3
3G01	A3
3G02	A4
3G03	B4
3G04	B3
3G05	B3
3G06	B4
3G07	B4
3G08	J5
3G09	I4
3G12	C3
3G13	C3
3G14	D3
3G15	C3
3G16	C3
3G17	D3
3G26	D2
3G27	D3
3G28	E3
3G29	E3
3G30	E3
3G31	F3
3G32	E4
3G33	F3
3G34	E5
3G37	G3
3G38	G3
3G39	G4
3G40	G4
3G41	G3
3G42	H3
3G43	H4
3G44	H4
3G45	I3
3G46	I3
3G47	I6
3G48	I6
3G51	H3
3G52	H4
3G53	J3
3G54	J4
3G55	I5
3G56	J5
3G57	K3
3G58	J3
3G59	J4
3G60	K4
3G63	B9
3G64	C9
3G65	B11
3G66	C9
3G67	C10
3G68	C10
3G69	B12
3G70	C12
3G71	C14
3G72	D10
3G73	D10
3G74	D10
3G75	E9
3G76	F9
3G77	F10
3G78	F10
3G79	D12
3G80	D13
3G81	D13
3G82	D13
3G83	E12
3G84	F12
3G85	F13
3G86	F13
3G87	F13
3G88	H12
3G89	F12
3G90	H11
3G91	H12
3G92	J9
3G93	K9
3G94	I9
3G95	I9
3G96	I9
3G99	I8
3S00	J9
3S01	G9
3S03	J8
4G00	A3
4G01	B3
4G05	G3
4G06	G3
4G09	B11
4G10	B11
4G11	D12
4G12	D12
4G13	D12
4G14	E9
4G15	F9
4G16	G11
4G17	G11
4G18	J5
4G19	H9
4G20	K9
4G21	I9
4G22	K10
4G26	E4
5G00	E4
5G01	D10
5G02	I11
6G00	F3
6G01	K3
6G02	B13
6G03	B2
6G04	C2
6G05	A2
6G06	B2
6G07	F2
6G08	F2
6G09	G2
6G10	G2
7G03	E4
7G05	J4
7G07	B11
7G08	B13
7G09	E11
7G10	J10
FG00	A2
FG01	A2
FG02	B1
FG03	B2
FG04	B2
FG05	C2
FG06	C2
FG07	C2
FG08	D2
FG09	E2
FG10	D2
FG11	E2
FG12	F2
FG13	F6
FG14	G2
FG15	G2
FG16	G1
FG17	G2
FG18	H2
FG19	H1
FG20	I2
FG21	H2
FG22	J2
FG23	J2
FG24	C1
FG25	C1
FG26	G2
FG27	H2
FG28	H2
FG30	I2
FG32	G14
FG33	G14
FG34	G14
FG35	G14
FG36	G14
FG37	H14
FG38	H14
FG39	H14
FG40	H15
FG41	H14
FG42	H14
FG43	H14
FG44	H14
FG45	H14
FG47	I14
FG48	I14
FG49	I14
FG50	I14
FG51	I14
FG53	I14
FG54	I14
FG56	I14
IG00	A4
IG01	A4
IG02	A5
IG03	B5
IG04	B4
IG05	B4
IG06	C6
IG07	C6
IG08	D6
IG09	D6
IG10	D6
IG11	E3
IG12	E4
IG13	E6
IG14	G4
IG15	G4
IG16	G5
IG17	G5
IG18	G4
IG19	H4
IG20	G5
IG21	H5
IG23	H5
IG24	J4
IG25	J5
IG26	J5
IG27	K5
IG28	D10
IG29	E11
IG30	F12
IG40	I4
IG42	I5
IG43	J4
IG46	I11
IG47	K9
IG49	B8
IG50	B11
IG52	C11
IG53	C11
IG54	C11
IG55	C11
IG56	D10
IG57	B13
IG58	B13
IG59	D14
IG60	E11
IG61	F11
IG62	F11
IG63	F11
IG64	E12
IG67	F12
IG69	F12
IG73	I8
IG75	I9
IG76	J8
IG78	J9
IG79	K9
IG80	I10
S011	A2
S012	B2
S013	B2
S014	B2
S015	C2
S016	C2
S017	C3
S018	C2
S019	D2
S020	E2
S021	E2
S022	E2
S023	F2
S024	G3
S025	G3
S026	H3
S027	H2
S028	G2
S029	H2
S030	H2
S031	H2
S032	I2
S033	I2
S034	I2
S035	J2
S036	K2

SSB: Top Connectors


B16 TOP CONNECTORS
B16
FOR UFD ONLY
B6
FROM SCALER INTERFACE
FROM SCALER
B8
(1M03)
1J00
UFD CONTROL
IJ01 POR (NC)
IJ02 LAMP_ON_OFF_1
IJ03
IJ04
5J05 RES
FAN_SPEED
TEMP_SENSOR (NC)
IJ05 STANDBY_1
PROTECT_AUD
IJ06 NC
IJ07 POWER_UP_OK_1
3J06 RES
POWER_UP_OK
IJ12
FROM SCALER
B7
4J02 RES
2J16 RES
2J33 RES
2J20 RES
2J34 RES
(1M46)
1J01
UFD SUPPLY
FJ00
FJ01 (NC)
FJ02
1J07 +12V_UFD
5V(NC) 3A T
FJ03
1J08
FJ04 +5V_UFD
+33V_TUN(NC)
FJ05 NC
4J01
2J31 1n0
B6
TO DC-DC CONVERTER
5J04
+5V
1J02
TO/FROM PSU (SUPPLY FOR LCD)
VP
GND_AUDIO
FJ06
3V2 +3V3STBY
FJ07
IJ08
IJ09
IJ10
IJ11
5J03
POWER_DOWN
11V6 +12VUNREG
3J05 68R
3J03 68R
3J04 68R
STANDBY 3V1
BACKLIGHT_CTRL
LAMP_ON_OFF 3V2
IJ13
B9
FROM SCALER INTERFACE
FROM SCALER
B8
B12P-PH-K-S(LF)
2J30 1n0
2J02 1n0
2J35 1n0
2J18 100p
2J19 100p
2J17 100p
2J22 100p
2J23 100p
2J21 100p
TO/FROM 1003 OF CLASS-D AUDIO AMP (+18V / +24V)
C
1J03
B3B-PH-K-S(LF)
FJ08
FJ09
VP
GND_AUDIO
2J03 1n0
GND_AUDIO
B5
FROM AUDIO
AUDIO-L
5J01
FJ10
FJ11
AUDIO-R
5J02
FJ12
AUDIO-SW (NC)
PROTECT_AUD
3V3 SOUND_ENABLE_1
3V3 POR_AUDIO
FJ13
FJ14
(1M52)
1J04
B9B-PH-K-S(LF)
2J26 100p
2J27 100p
2J28 100p
2J29 100p
2J36 1n0
TO/FROM 1002 OF CLASS-D AUDIO AMPLIFIER
C
B20
FROM EPLD
B_LT_PWM
G_LT_PWM
R_LT_PWM
B_RT_PWM
G_RT_PWM
R_RT_PWM
FJ15
FJ16
FJ17
FJ18
FJ19
FJ20
1J05
B7B-PH-K-S(LF)
AMBIENT LIGHT (TOP)
2J04 100p
2J05 100p
2J06 100p
2J07 100p
2J08 100p
2J09 100p
B_LB_PWM
G_LB_PWM
R_LB_PWM
B_RB_PWM
G_RB_PWM
R_RB_PWM
FJ21
FJ22
FJ23
FJ24
FJ25
FJ26
1J06
B7B-PH-K-S(LF)
AMBIENT LIGHT (BOTTOM)
2J10 100p
2J11 100p
2J12 100p
2J13 100p
2J14 100p
2J15 100p
RESERVED
A
B
C
D
E
F
1
2
3
4
5
6
7
8
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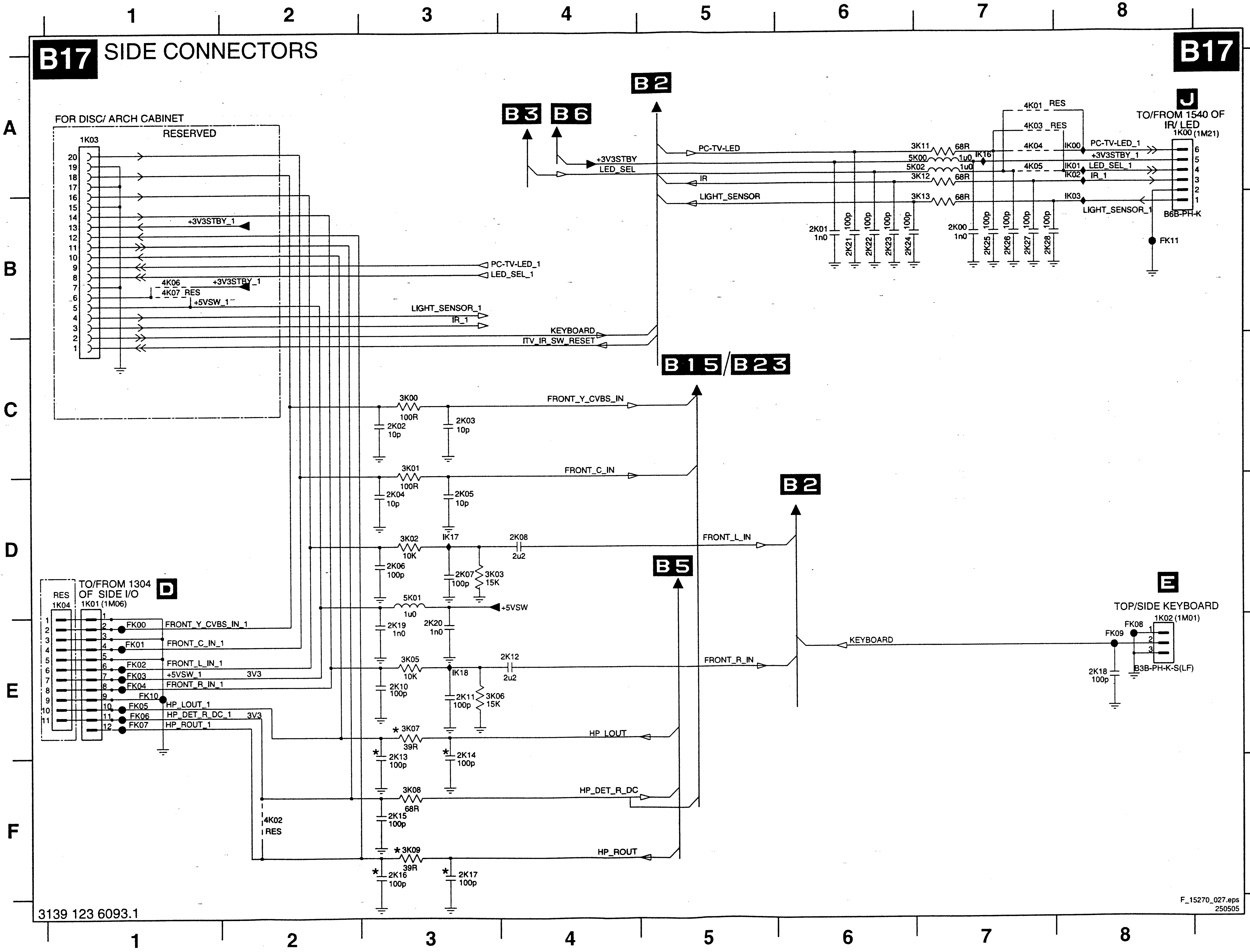
170505
3139 123 6093.1

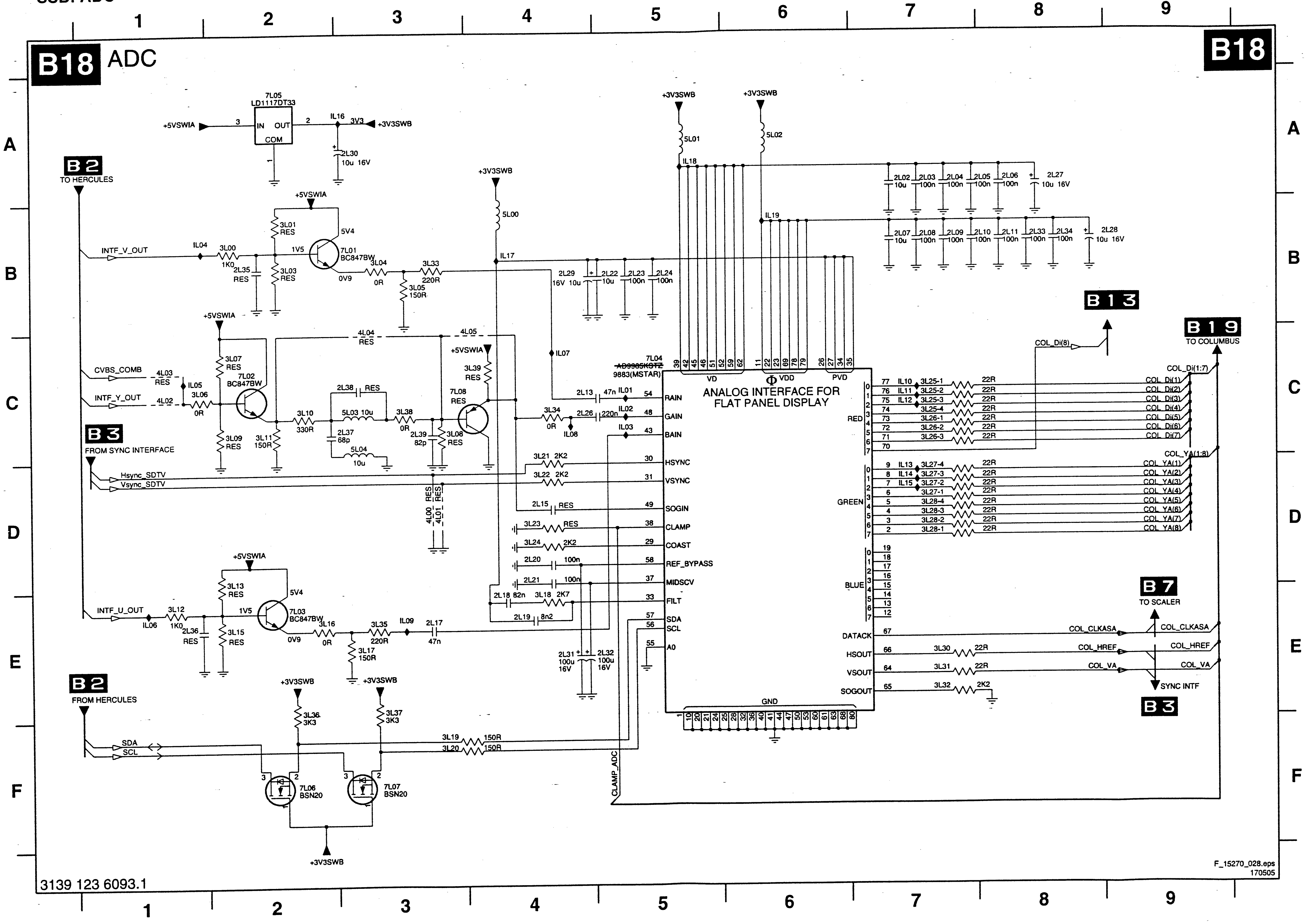
1J00 B1	FJ25 E7
1J01 C1	FJ26 E7
1J02 D1	IJ01 B1
1J03 F1	IJ02 B1
1J04 B8	IJ03 B1
1J05 C8	IJ04 B1
1J06 E8	IJ05 B1
1J07 C2	IJ06 B1
1J08 C2	IJ07 B1
2J02 F2	IJ08 E2
2J03 F2	IJ09 E2
2J04 D6	IJ10 E2
2J05 D7	IJ11 E2
2J06 D7	IJ12 B4
2J07 D7	IJ13 E4
2J08 D7	
2J09 D7	
2J10 E6	
2J11 E7	
2J12 E7	
2J13 E7	
2J14 E7	
2J15 E7	
2J16 C2	
2J17 F3	
2J18 F2	
2J19 F3	
2J20 C3	
2J21 F3	
2J22 F3	
2J23 F3	
2J26 C6	
2J27 C7	
2J28 C7	
2J29 C7	
2J30 F2	
2J31 D2	
2J33 C2	
2J34 C3	
2J35 F2	
2J36 C7	
3J03 E3	
3J04 E3	
3J05 E3	
3J06 B3	
4J01 D2	
4J02 C2	
5J01 B7	
5J02 B7	
5J03 E2	
5J04 C2	
5J05 B3	
FJ00 C1	
FJ01 C1	
FJ02 C1	
FJ03 C1	
FJ04 C1	
FJ05 D1	
FJ06 E2	
FJ07 E2	
FJ08 F1	
FJ09 F2	
FJ10 B7	
FJ11 B8	
FJ12 B7	
FJ13 B7	
FJ14 C7	
FJ15 C7	
FJ16 C7	
FJ17 D7	
FJ18 D7	
FJ19 D7	
FJ20 D7	
FJ21 E7	
FJ22 E7	
FJ23 E7	
FJ24 E7	

SSB: Side Connectors


B17 SIDE CONNECTORS
B17
FOR DISC/ ARCH CABINET
RESERVED
1K03
+3V3STBY_1
PC-TV-LED_1
LED_SEL_1
4K06
4K07 RES
+5VSW_1
LIGHT_SENSOR_1
IR_1
KEYBOARD
ITV_IR_SW_RESET
B3
B6
B2
+3V3STBY
LED_SEL
PC-TV-LED
IR
LIGHT_SENSOR
4K01 RES
4K03 RES
4K04
4K05
3K11 68R
5K00 1u0
5K02 1u0
3K12 68R
3K13 68R
IK16
IK00
IK01
IK02
IK03
J
TO/FROM 1540 OF IR/ LED
1K00 (1M21)
B6B-PH-K
FK11
2K01 1n0
2K21 100p
2K22 100p
2K23 100p
2K24 100p
2K00 1n0
2K25 100p
2K26 100p
2K27 100p
2K28 100p
B15/B23
3K00 100R
2K02 10p
2K03 10p
FRONT_Y_CVBS_IN
3K01 100R
2K04 10p
2K05 10p
FRONT_C_IN
B2
3K02 10K
IK17
2K08 2u2
2K06 100p
2K07 100p
3K03 15K
FRONT_L_IN
B5
5K01 1u0
+5VSW
2K19 1n0
2K20 1n0
3K05 10K
IK18
2K12 2u2
2K10 100p
2K11 100p
3K06 15K
FRONT_R_IN
E
TOP/SIDE KEYBOARD
1K02 (1M01)
FK08
FK09
KEYBOARD
2K18 100p
B3B-PH-K-S(LF)
RES
1K04
TO/FROM 1304 OF SIDE I/O
D
1K01 (1M06)
FK00 FRONT_Y_CVBS_IN_1
FK01 FRONT_C_IN_1
FK02 FRONT_L_IN_1
FK03 +5VSW_1 3V3
FK04 FRONT_R_IN_1
FK10
FK05 HP_LOUT_1
FK06 HP_DET_R_DC_1 3V3
FK07 HP_ROUT_1
3K07 39R
2K13 100p
2K14 100p
HP_LOUT
3K08 68R
2K15 100p
HP_DET_R_DC
4K02 RES
3K09 39R
2K16 100p
2K17 100p
HP_ROUT
3139 123 6093.1
F_15270_027.eps
250505

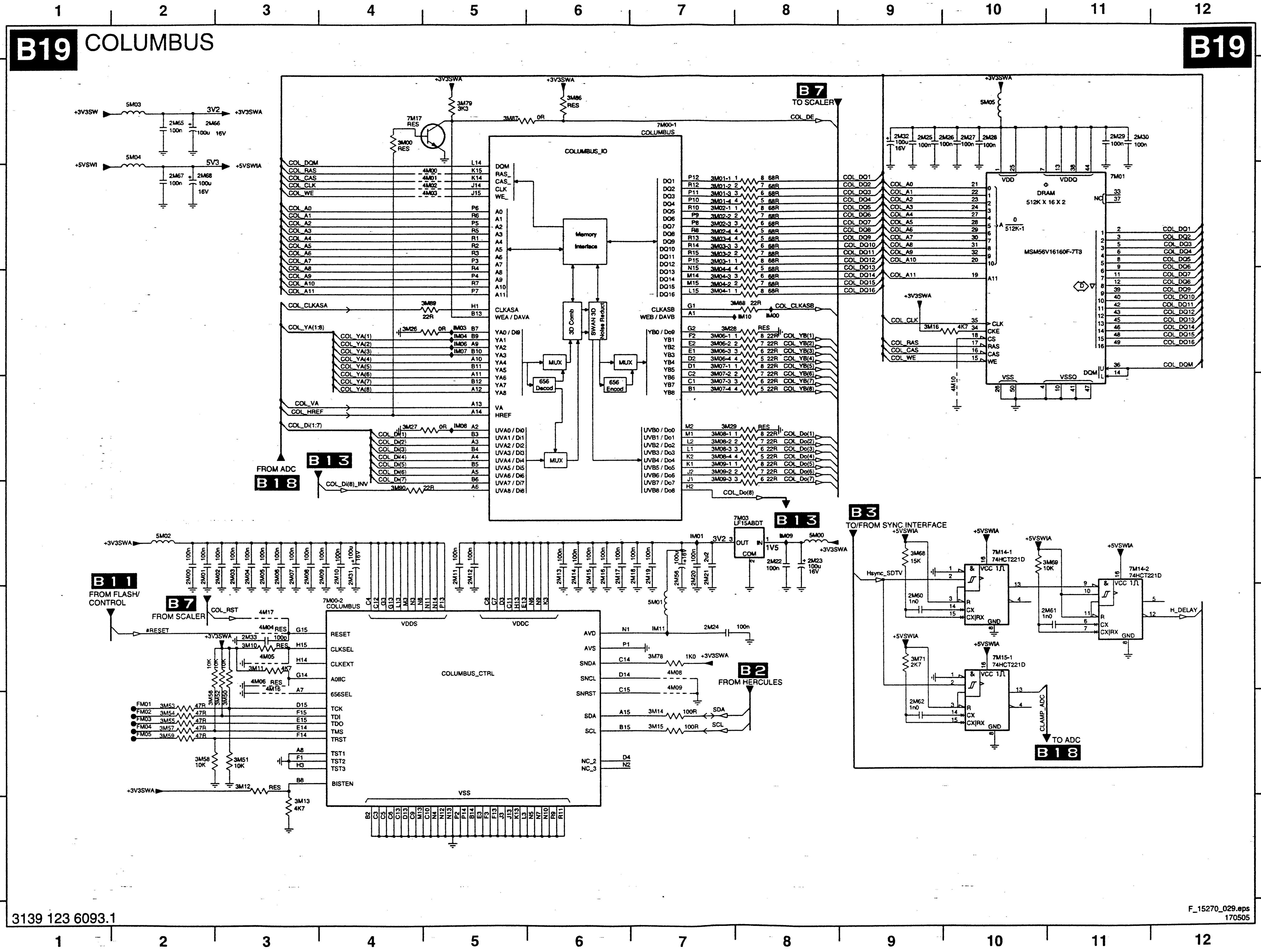
1K00	A8
1K01	D1
1K02	E8
1K03	A1
1K04	D1
2K00	B7
2K01	B6
2K02	C3
2K03	C3
2K04	D3
2K05	D3
2K06	D3
2K07	D3
2K08	D4
2K10	E3
2K11	E3
2K12	E4
2K13	F3
2K14	E3
2K15	F3
2K16	F3
2K17	F3
2K18	E8
2K19	E3
2K20	E3
2K21	B6
2K22	B6
2K23	B6
2K24	B6
2K25	B7
2K26	B7
2K27	B7
2K28	B7
3K00	C3
3K01	C3
3K02	D3
3K03	D3
3K05	E3
3K06	E3
3K07	E3
3K08	F3
3K09	F3
3K11	A7
3K12	A7
3K13	B7
4K01	A7
4K02	F2
4K03	A7
4K04	A7
4K05	A7
4K06	B1
4K07	B1
5K00	A7
5K01	D3
5K02	A7
FK00	E1
FK01	E1
FK02	E1
FK03	E1
FK04	E1
FK05	E1
FK06	E1
FK07	E1
FK08	E8
FK09	E8
FK10	E1
FK11	B8
IK00	A8
IK01	A8
IK02	A8
IK03	B8
IK16	A7
IK17	D3
IK18	E3

SSB: ADC


B18
ADC
7L05
LD1117DT33
+5VSWIA
IN
OUT
COM
IL16
3V3
+3V3SWB
2L30
10u 16V
B2
TO HERCULES
+5VSWIA
3L01
RES
5V4
INTF_V_OUT
IL04
3L00
1K0
2L35
RES
3L03
RES
1V5
7L01
BC847BW
0V9
3L04
0R
3L33
220R
3L05
150R
+3V3SWB
5L00
IL17
2L29
16V 10u
2L22
10u
2L23
100n
2L24
100n
+3V3SWB
5L01
IL18
+3V3SWB
5L02
IL19
2L02
10u
2L03
100n
2L04
100n
2L05
100n
2L06
100n
2L27
10u 16V
2L07
10u
2L08
100n
2L09
100n
2L10
100n
2L11
100n
2L33
100n
2L34
100n
2L28
10u 16V
B13
COL_Di(8)
B19
TO COLUMBUS
4L04
RES
4L05
+5VSWIA
3L07
RES
7L02
BC847BW
CVBS_COMB
4L03
RES
IL05
INTF_Y_OUT
4L02
3L06
0R
IL07
2L38
RES
3L10
330R
5L03 10u
3L38
0R
2L37
68p
5L04
10u
2L39
82p
3L08
RES
7L08
RES
3L39
RES
3L09
RES
3L11
150R
B3
FROM SYNC INTERFACE
Hsync_SDTV
Vsync_SDTV
4L00
4L01
RES
7L04
AD9985KSTZ
9883(MSTAR)
VD
VDD
PVD
ANALOG INTERFACE FOR FLAT PANEL DISPLAY
2L13
47n
IL01
RAIN
3L34
0R
2L26
220n
IL02
GAIN
IL08
IL03
BAIN
3L21 2K2
HSYNC
3L22 2K2
VSYNC
2L15
RES
SOGIN
3L23
RES
CLAMP
3L24
2K2
COAST
2L20
100n
REF_BYPASS
2L21
100n
MIDSCV
2L18 82n
3L18 2K7
FILT
2L19
8n2
SDA
SCL
A0
GND
RED
GREEN
BLUE
IL10
IL11
IL12
3L25-1
3L25-2
3L25-3
3L25-4
3L26-1
3L26-2
3L26-3
22R
COL_Di(1:7)
COL_Di(1)
COL_Di(2)
COL_Di(3)
COL_Di(4)
COL_Di(5)
COL_Di(6)
COL_Di(7)
IL13
IL14
IL15
3L27-4
3L27-3
3L27-2
3L27-1
3L28-4
3L28-3
3L28-2
3L28-1
COL_YA(1:8)
COL_YA(1)
COL_YA(2)
COL_YA(3)
COL_YA(4)
COL_YA(5)
COL_YA(6)
COL_YA(7)
COL_YA(8)
B7
TO SCALER
DATACK
COL_CLKASA
HSOUT
3L30
COL_HREF
VSOUT
3L31
COL_VA
SOGOUT
3L32
2K2
SYNC INTF
B3
+5VSWIA
3L13
RES
5V4
INTF_U_OUT
IL06
3L12
1K0
2L36
RES
3L15
RES
1V5
7L03
BC847BW
0V9
3L16
0R
3L35
220R
IL09
2L17
47n
3L17
150R
2L31
100u
16V
2L32
100u
16V
B2
FROM HERCULES
+3V3SWB
3L36
3K3
+3V3SWB
3L37
3K3
SDA
SCL
3L19 150R
3L20 150R
CLAMP_ADC
7L06
BSN20
7L07
BSN20
+3V3SWB
3139 123 6093.1
F_15270_028.eps
170505

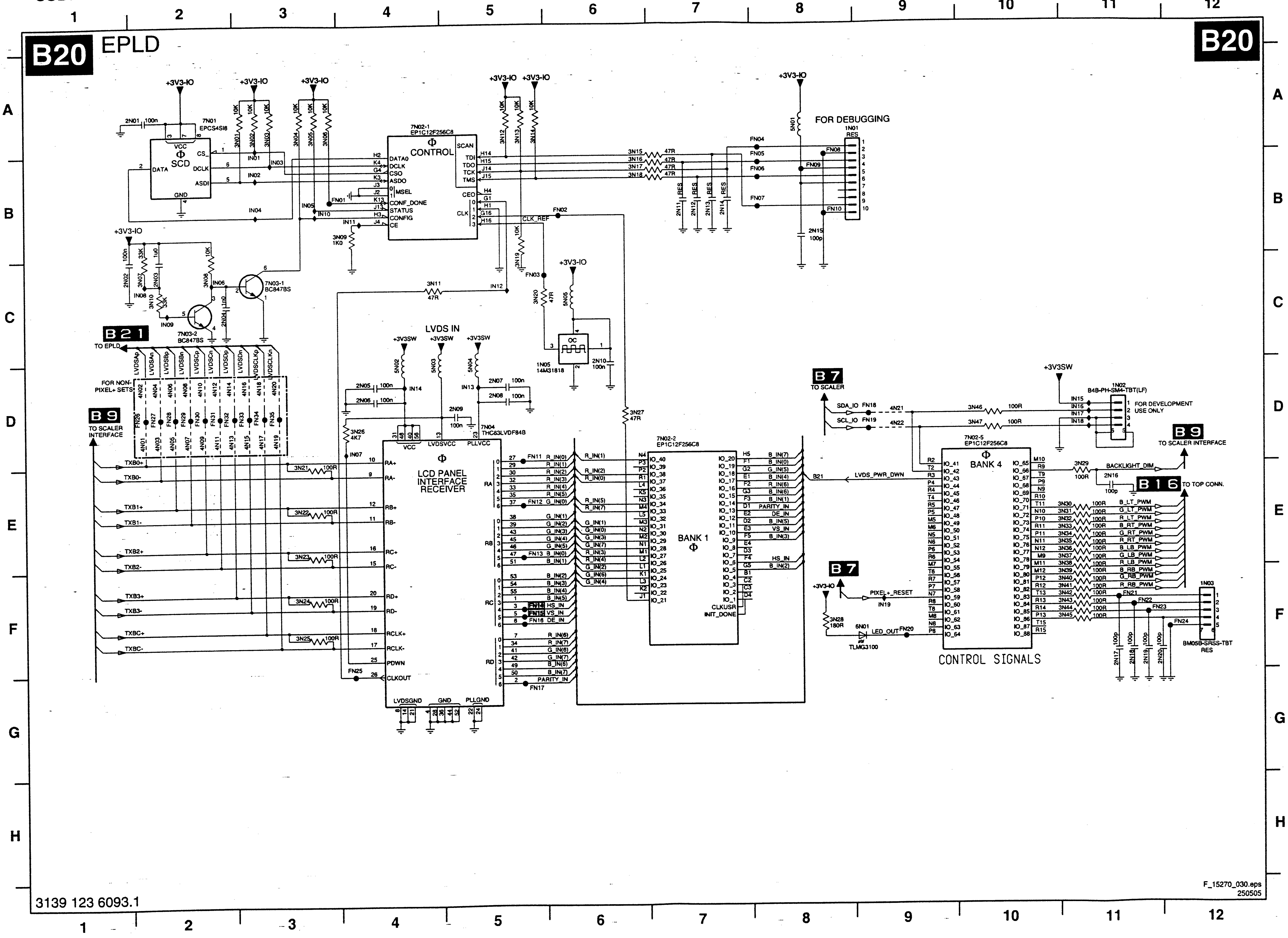
2L02	A7
2L03	A7
2L04	A7
2L05	A8
2L06	A8
2L07	B7
2L08	B7
2L09	B7
2L10	B8
2L11	B8
2L13	C4
2L15	D4
2L17	E3
2L18	E4
2L19	E4
2L20	D4
2L21	D4
2L22	B5
2L23	B5
2L24	B5
2L26	C4
2L27	A8
2L28	B9
2L29	B4
2L30	A3
2L31	E4
2L32	E5
2L33	B8
2L34	B8
2L35	B2
2L36	E1
2L37	C3
2L38	C3
2L39	C3
3L00	B2
3L01	B2
3L03	B2
3L04	B3
3L05	B3
3L06	C1
3L07	C2
3L08	C3
3L09	C2
3L10	C2
3L11	C2
3L12	E1
3L13	D2
3L15	E2
3L16	E2
3L17	E3
3L18	E4
3L19	F3
3L20	F3
3L21	C4
3L22	D4
3L23	D4
3L24	D4
3L25-1	C7
3L25-2	C7
3L25-3	C7
3L25-4	C7
3L26-1	C7
3L26-2	C7
3L26-3	C7
3L27-1	D7
3L27-2	D7
3L27-3	D7
3L27-4	D7
3L28-1	D7
3L28-2	D7
3L28-3	D7
3L28-4	D7
3L30	E7
3L31	E7
3L32	E7
3L33	B3
3L34	C4
3L35	E3
3L36	E2
3L37	E3
3L38	C3
3L39	C4
4L00	D3
4L01	D3
4L02	C1
4L03	C1
4L04	C3
4L05	C4
5L00	B4
5L01	A5
5L02	A6
5L03	C3
5L04	C3
7L01	B3
7L02	C2
7L03	E2
7L04	C5
7L05	A2
7L06	F2
7L07	F3
7L08	C3
IL01	C5
IL02	C5
IL03	C5
IL04	B1
IL05	C1
IL06	E1
IL07	C4
IL08	C4
IL09	E3
IL10	C7
IL11	C7
IL12	C7
IL13	D7
IL14	D7
IL15	D7
IL16	A3
IL17	B4
IL18	A5
IL19	B6

SSB: Columbus


B19 COLUMBUS
B19
7M00-1 COLUMBUS
COLUMBUS_IO
Memory Interface
3D Comb
SWAN 3D Noise Reduct
MUX
656 Decod
656 Encod
7M01
DRAM 512K X 16 X 2
MSM56V16160F-7T3
7M00-2 COLUMBUS
COLUMBUS_CTRL
VDDS
VDDC
VSS
7M03 LF15ABDT
7M14-1 74HCT221D
7M14-2 74HCT221D
7M15-1 74HCT221D
7M17
B7 TO SCALER
FROM ADC B18
B13
B3 TO/FROM SYNC INTERFACE
B11 FROM FLASH/ CONTROL
B7 FROM SCALER
B2 FROM HERCULES
TO ADC B18
H_DELAY
CLAMP_ADC
Hsync_SDTV
+3V3SW
+5VSWI
+3V3SWA
+5VSWIA
3V2
5V3
1V5
3139 123 6093.1
F_15270_029.eps
170505
1 2 3 4 5 6 7 8 9 10 11 12
A B C D E F G H

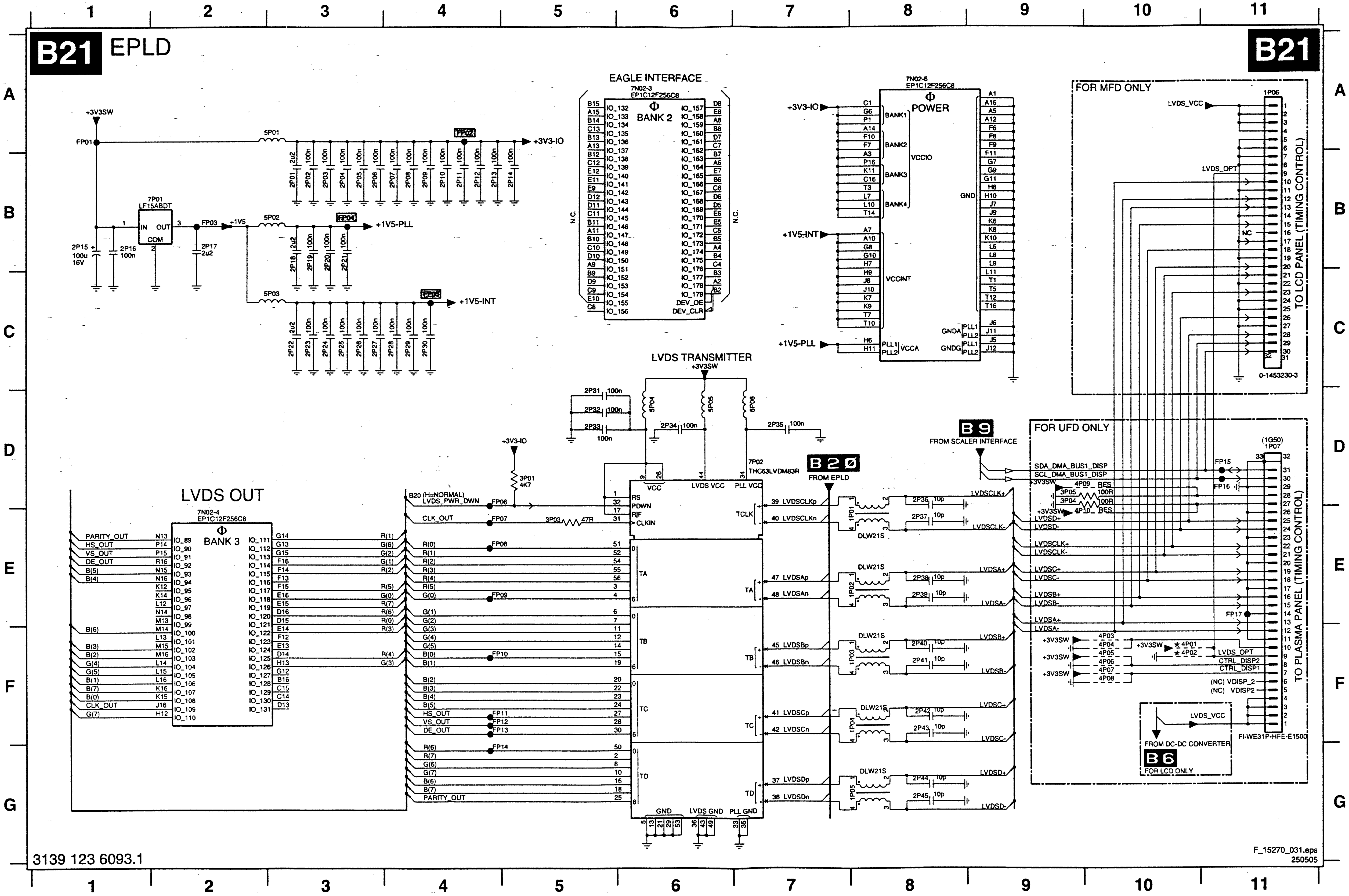
2M00	E2
2M01	E2
2M02	E3
2M03	E3
2M04	E3
2M05	E3
2M06	E3
2M07	E3
2M08	E3
2M09	E4
2M10	E4
2M11	E5
2M12	E5
2M13	E6
2M14	E6
2M15	E6
2M16	E6
2M17	E6
2M18	E7
2M19	E7
2M20	E7
2M21	E7
2M22	E8
2M23	E8
2M24	F7
2M25	A9
2M26	A10
2M27	A10
2M28	A10
2M29	A11
2M30	A11
2M31	E4
2M32	A9
2M33	F3
2M56	E7
2M60	F9
2M61	F11
2M62	G9
2M65	A2
2M66	A2
2M67	B2
2M68	B2
3M00	A4
3M01-1	B7
3M01-2	B7
3M01-3	B7
3M01-4	B7
3M02-1	B7
3M02-2	B7
3M02-3	B7
3M02-4	B7
3M03-1	B7
3M03-2	B7
3M03-3	B7
3M03-4	B7
3M04-1	C7
3M04-2	C7
3M04-3	C7
3M04-4	C7
3M06-1	C7
3M06-2	C7
3M06-3	C7
3M06-4	C7
3M07-1	C7
3M07-2	D7
3M07-3	D7
3M07-4	D7
3M08-1	D7
3M08-2	D7
3M08-3	D7
3M08-4	D7
3M09-1	D7
3M09-2	D7
3M09-3	E7
3M10	F3
3M11	F3
3M12	G3
3M13	H3
3M14	G7
3M15	G7
3M16	C9
3M26	C4
3M27	D4
3M28	C7
3M29	D7
3M50	G3
3M51	G3
3M52	G3
3M53	G2
3M54	G2
3M55	G2
3M56	G2
3M57	G2
3M58	G2
3M59	G2
3M68	E9
3M69	E11
3M71	F9
3M78	F7
3M79	A5
3M86	A6
3M87	A5
3M88	C8
3M89	C5
3M90	E4
4M00	B5
4M01	B5
4M02	B5
4M03	B5
4M04	F3
4M05	F3
4M06	F3
4M08	F7
4M09	F7
4M10	D10
4M16	F3
4M17	F3
5M00	E8
5M01	F7
5M02	E2
5M03	A2
5M04	A2
5M05	A10
7M00-1	A7
7M00-2	F4
7M01	B11
7M03	E8
7M14-1	E10
7M14-2	E11
7M15-1	F10
7M17	A4
FM01	G2
FM02	G2
FM03	G2
FM04	G2
FM05	G2
IM00	C8
IM01	E7
IM03	C5
IM04	C5
IM06	C5
IM07	C5
IM08	D5
IM09	E8
IM10	C8
IM11	F7

SSB: EPLD


B20
EPLD
7N01 EPCS4SI8
SCD
7N02-1 EP1C12F256C8
CONTROL
FOR DEBUGGING
1N01 RES
7N03-1 BC847BS
7N03-2 BC847BS
1N05 14M31818
B21 TO EPLD
FOR NON-PIXEL+ SETS
B9 TO SCALER INTERFACE
LVDS IN
7N04 THC63LVDF84B
LCD PANEL INTERFACE RECEIVER
7N02-2 EP1C12F256C8
BANK 1
B7 TO SCALER
1N02 B4B-PH-SM4-TBT(LF)
FOR DEVELOPMENT USE ONLY
B9 TO SCALER INTERFACE
7N02-5 EP1C12F256C8
BANK 4
B16 TO TOP CONN.
B7
6N01 TLMG3100
CONTROL SIGNALS
1N03 BM05B-SRSS-TBT RES
3139 123 6093.1
F_15270_030.eps 250505

1N01	A9
1N02	D11
1N03	F12
1N05	D5
2N01	A2
2N02	C1
2N03	C2
2N04	C2
2N05	D4
2N06	D4
2N07	D5
2N08	D5
2N09	D5
2N10	D6
2N11	B7
2N12	B7
2N13	B7
2N14	B7
2N15	B8
2N16	E11
2N17	F11
2N18	F11
2N19	F11
2N20	F11
3N01	A3
3N02	A3
3N03	A3
3N04	A3
3N05	A3
3N06	A3
3N07	C2
3N08	C2
3N09	B4
3N10	C2
3N11	C4
3N12	A5
3N13	A5
3N14	A5
3N15	B6
3N16	B6
3N17	B6
3N18	B6
3N19	C5
3N20	C5
3N21	E3
3N22	E3
3N23	E3
3N24	F3
3N25	F3
3N26	D4
3N27	D6
3N28	F8
3N29	E11
3N30	E11
3N31	E11
3N32	E11
3N33	E11
3N34	E11
3N35	E11
3N36	E11
3N37	E11
3N38	F11
3N39	F11
3N40	F11
3N41	F11
3N42	F11
3N43	F11
3N44	F11
3N45	F11
3N46	D10
3N47	D10
4N01	D2
4N02	D2
4N03	D2
4N04	D2
4N05	D2
4N06	D2
4N07	D2
4N08	D2
4N09	D2
4N10	D2
4N11	D2
4N12	D2
4N13	D2
4N14	D2
4N15	D3
4N16	D3
4N17	D3
4N18	D3
4N19	D3
4N20	D3
4N21	D9
4N22	D9
5N01	A8
5N02	D4
5N03	D4
5N04	D5
5N05	C6
6N01	F9
7N01	A2
7N02-1	A4
7N02-2	D7
7N02-5	D10
7N03-1	C3
7N03-2	C2
7N04	D5
FN01	B4
FN02	B6
FN03	C5
FN04	A8
FN05	B8
FN06	B8
FN07	B8
FN08	B8
FN09	B8
FN10	B8
FN11	D5
FN12	E5
FN13	E5
FN14	F5
FN15	F5
FN16	F5
FN17	G5
FN18	D9
FN19	D9
FN20	F9
FN21	F11
FN22	F11
FN23	F11
FN24	F12
FN25	F4
FN26	D2
FN27	D2
FN28	D2
FN29	D2
FN30	D2
FN31	D2
FN32	D2
FN33	D3
FN34	D3
FN35	D3
IN01	B3
IN02	B3
IN03	B3
IN04	B3
IN05	B3
IN06	C2
IN07	D4
IN08	C2
IN09	C2
IN10	B3
IN11	B4
IN12	C5
IN13	D5
IN14	D4
IN15	D11
IN16	D11
IN17	D11
IN18	D11
IN19	F9

SSB: EPLD


B21
EPLD
EAGLE INTERFACE
7N02-3
EP1C12F256C8
BANK 2
7N02-6
EP1C12F256C8
POWER
VCCIO
VCCINT
GND
VCCA
GNDA
GNDG
BANK1
BANK2
BANK3
BANK4
PLL1
PLL2
+3V3SW
+3V3-IO
+1V5-PLL
+1V5-INT
7P01
LF15ABDT
IN
OUT
COM
FP01
FP02
FP03
FP04
FP05
5P01
5P02
5P03
LVDS TRANSMITTER
7P02
THC63LVDM83R
LVDS OUT
7N02-4
EP1C12F256C8
BANK 3
B20
FROM EPLD
B9
FROM SCALER INTERFACE
FOR MFD ONLY
1P06
TO LCD PANEL (TIMING CONTROL)
FOR UFD ONLY
1P07
TO PLASMA PANEL (TIMING CONTROL)
FROM DC-DC CONVERTER
B6
FOR LCD ONLY
FI-WE31P-HFE-E1500
0-1453230-3
DLW21S
LVDS_VCC
LVDS_OPT
CTRL_DISP1
CTRL_DISP2
SDA_DMA_BUS1_DISP
SCL_DMA_BUS1_DISP
LVDS_PWR_DWN
CLK_OUT
PARITY_OUT
HS_OUT
VS_OUT
DE_OUT
3139 123 6093.1
F_15270_031.eps
250505

1P01	E8
1P02	E8
1P03	F8
1P04	F8
1P05	G8
1P06	A11
1P07	D11
2P01	B3
2P02	B3
2P03	B3
2P04	B3
2P05	B3
2P06	B3
2P07	B4
2P08	B4
2P09	B4
2P10	B4
2P11	B4
2P12	B4
2P13	B4
2P14	B5
2P15	B1
2P16	B1
2P17	B2
2P18	B3
2P19	B3
2P20	B3
2P21	B3
2P22	C3
2P23	C3
2P24	C3
2P25	C3
2P26	C3
2P27	C3
2P28	C4
2P29	C4
2P30	C4
2P31	C5
2P32	D5
2P33	D5
2P34	D6
2P35	D7
2P36	D8
2P37	E8
2P38	E8
2P39	E8
2P40	F8
2P41	F8
2P42	F8
2P43	F8
2P44	G8
2P45	G8
3P01	D5
3P03	E5
3P04	D9
3P05	D9
4P01	F10
4P02	F10
4P03	F10
4P04	F10
4P05	F10
4P06	F10
4P07	F10
4P08	F10
4P09	D9
4P10	E9
5P01	A3
5P02	B3
5P03	C3
5P04	D6
5P05	D6
5P06	D7
7N02-3	A6
7N02-4	E2
7N02-6	A8
7P01	B2
7P02	D7
FP01	A1
FP02	A4
FP03	B2
FP04	B3
FP05	C4
FP06	D4
FP07	E4
FP08	E4
FP09	E4
FP10	F4
FP11	F4
FP12	F4
FP13	F4
FP14	G4
FP15	D11
FP16	D11
FP17	E11

SSB: Diversity Tables B9-B21

B9 MUX-SYNC INTERFACE

Item	LC4.3x	LC4.8x	LC4.9x	Description
2A00			V	CER2 0603 X7R 16V 100N COL
2A01			V	CER1 0402 NP0 50V 100P COL
2A02			V	CER1 0402 NP0 50V 100P COL
2A03		V		CER2 0603 Y5V 10V 1U COL
2A12		V	V	CER2 0402 X7R 16V 10N COL
2A13		V	V	CER2 0402 Y5V 16V 100N COL
3A00			V	RST SM 0402 68R PM5 COL
3A01			V	RST SM 0402 68R PM5 COL
3A02	V	V		RST SM 0402 1K PM5 COL
3A06		V		RST SM 0603 10K PM5COL
3A06	V			RST SM 0603 JUMP. 0R05 COL
3A07			V	RST SM 0402 10K PM5 COL
3A07				RST SM 0402 68R PM5 COL
3A08			V	RST SM 0402 10K PM5 COL
3A10		V	V	RST SM 0402 10K PM5 COL
3A11		V	V	RST SM 0402 10K PM5 COL
3A13		V	V	RST SM 0402 10K PM5 COL
3A14		V	V	RST SM 0402 560R PM5 COL
4A03	V	V		RST SM 0603 JUMP. 0R05 COL
4A04			V	RST SM 0402 JUMP. 0R05 COL
4A05	V			RST SM 0402 JUMP. 0R05 COL
4A06	V			RST SM 0402 JUMP. 0R05 COL
5A00			V	FXDIND 0805 100MHZ 30R COL R
6A01		V	V	DIO REG SM BZX384-C3V9 COL R
7A00			V	IC SM PCA9515ADP (PHSE) R
7A02		V	V	TRA SIG SM BC847BW (COL) R
7A03		V	V	TRA SIG SM BC847BW (COL) R

B13 MUX-SYNC INTERFACE

ITEM	AP/EU/AP-DVB (with Teletext)	EU-DVB (with Teletext)	NAFTA/LT & China (non-Teletext)	DESCRIPTION
2E00	V		V	CER2 0603 X5R 6V3 4U7 PM10 R
2E01	V		V	CER2 0603 X5R 6V3 4U7 PM10 R
2E02	V		V	CER2 0603 X5R 6V3 4U7 PM10 R
2E04	V	V		CER2 0402 X5R 6V3 1U PM20 R
2E05	V	V		CER2 0402 X5R 6V3 1U PM20 R
2E06	V	V		CER2 0402 X5R 6V3 1U PM20 R
3E06	V		V	RST SM 0402 47K PM5 COL
3E07	V		V	RST SM 0402 47K PM5 COL
3E08	V		V	RST SM 0402 47K PM5 COL
3E13	V	V		RST SM 0402 330R PM5 COL
3E14	V	V		RST SM 0402 330R PM5 COL
3E15	V	V		RST SM 0402 330R PM5 COL
3E16	V	V		RST SM 0402 330R PM5 COL
3E17	V	V		RST SM 0402 330R PM5 COL
3E18	V	V		RST SM 0402 330R PM5 COL

B15 ANALOG I/O SCART

Item	26/32PF	DVB.T 26/32PF	37/42PF	DVB.T 37/42PF	Description
1G01	V	V			SOC EURO H 21P F BK R-GRND B
1G01			V	V	SOC EURO H 21P F SHD R-GRND Y
1G02	V	V			SOC EURO H 21P F BK R-GRND B
1G02			V	V	SOC EURO H 21P F SHD R-GRND Y
1G03		V		V	CON H 32P F 0.50 SM FPC 0.3 R
2G29		V		V	ELCAP SM 16V 10U PM20 COL R
2G30		V		V	CER2 0603 X7R 16V 100N COL
2G31		V		V	CER2 0603 X7R 16V 100N COL
2G32				V	CER2 0603 Y5V 25V 100N COL
2G33		V		V	CER2 0603 Y5V 16V 220N COL
2G34		V		V	ELCAP SM 16V 10U PM20 COL R
2G35		V		V	CER2 0603 Y5V 25V 100N COL
2G36		V		V	CER2 0603 Y5V 10V 1U COL
2G37		V		V	RST SM 0603 330R PM5 COL
2G38		V		V	CER2 0603 Y5V 10V 1U COL
2G39		V		V	CER2 0603 Y5V 10V 1U COL
2G40		V		V	RST SM 0603 JUMP. 0R05 COL
2G41		V		V	RST SM 0603 330R PM5 COL
2G43		V		V	CER2 0603 X7R 50V 1N COL
2G45		V		V	CER2 0603 X7R 50V 1N COL
2G46		V		V	CER2 0603 X7R 50V 1N COL
2G63		V		V	CER2 0603 X5R 6V3 2U2 PM10 R
2G64		V		V	CER2 0603 X5R 6V3 2U2 PM10 R
2G65		V		V	CER2 0603 X5R 6V3 4U7 PM10 R
2G65		V		V	CER2 0603 X5R 6V3 4U7 PM10 R
2G66		V		V	CER2 0603 X5R 6V3 4U7 PM10 R
2G66		V		V	CER2 0603 X5R 6V3 4U7 PM10 R
3G63		V		V	RST SM 0603 10K PM5COL
3G64		V		V	RST SM 0603 10K PM5COL
3G65		V		V	RST SM 0603 10K PM5COL
3G66				V	RST SM 0603 150R PM5 COL
3G67		V		V	RST SM 0603 15K PM5 COL
3G68		V		V	RST SM 0603 15K PM5 COL
3G69		V		V	RST SM 0603 47K PM5 COL
3G70		V		V	RST SM 0603 47K PM5 COL
3G71		V		V	RST SM 0603 560R PM5 COL
3G72		V		V	RST SM 0603 10K PM5COL
3G73		V		V	RST SM 0603 47K PM5 COL
3G75		V		V	RST SM 0603 100R PM5 COL
3G76		V		V	RST SM 0603 100R PM5 COL
3G77		V		V	RST SM 0603 47K PM5 COL
3G79		V		V	RST SM 0603 47K PM5 COL
3G81		V		V	RST SM 0603 47K PM5 COL
3G83		V		V	RST SM 0603 100R PM5 COL
3G84		V		V	RST SM 0603 100R PM5 COL
3G86		V		V	RST SM 0603 47K PM5 COL
3G88		V		V	RST SM 0603 75R PM5 COL
3G89		V		V	RST SM 0603 47K PM5 COL
3G92		V		V	RST SM 0603 47K PM5 COL
3G93		V		V	RST SM 0603 47K PM5 COL
3G94		V		V	RST SM 0603 47K PM5 COL
3G95		V		V	RST SM 0603 47K PM5 COL
4G09		V		V	RST SM 0603 JUMP. 0R05 COL
4G11	V		V		RST SM 0603 JUMP. 0R05 COL
4G12	V		V		RST SM 0603 JUMP. 0R05 COL
4G13	V		V		RST SM 0603 JUMP. 0R05 COL
4G14	V		V		RST SM 0603 JUMP. 0R05 COL
4G15	V		V		RST SM 0603 JUMP. 0R05 COL
4G16	V		V		RST SM 0603 JUMP. 0R05 COL
4G17	V		V		RST SM 0603 JUMP. 0R05 COL
4G18	V		V		RST SM 0603 JUMP. 0R05 COL
4G19	V		V		RST SM 0603 JUMP. 0R05 COL
4G22		V		V	RST SM 0603 JUMP. 0R05 COL
5G01		V		V	FXDIND 0603 100MHZ 120R COL R
6G02		V		V	DIO SIG SM BAS316 (COL) R
7G07		V		V	IC SM 74HC4053D (PHSE) R
7G08		V		V	TRA SIG SM BC847B (COL) R
7G09		V		V	IC SM ADG734BRUZ (ANA0) R

B16 SIDE CONNECTORS

Item	LC4.3x - CINCH	LC4.3E - SCART	LC4.9x - PDP	LC4.8x - LCD	Description
1J00			V	V	CON V 10P M 2.00 PH B
1J01			V	V	CON V 11P M 2.00 PH B
1J02	V	V			CON V 12P M 2.00 PH B
1J03	V	V			CON V 3P M 2.00 PH B
1J07			V	V	FUSE SM T 3A 125V UL R
1J08			V	V	FUSE SM F 630MA 50V UL R
2J31			V	V	CER1 0402 NP0 50V 100P COL
3J03	V	V		V	RST SM 0402 68R PM5 COL
3J04	V	V		V	RST SM 0402 68R PM5 COL
4J01			V	V	RST SM 0402 JUMP. 0R05 COL
5J04			V	V	IND FXD 1206 EMI 100MHZ 120R R

B17 SIDE CONNECTORS

Item	LC4.3x - ME5 styling	LC4.3x - Arch Styling	LC4.8x - LCD	LC4.9x - PDP	Description
1K00	V		V	V	CON V 6P M 2.00 PH B
1K01	V				CON V 12P M 2.00 PH B
1K03		V			CON V 20P F 1.25 FFC 0.3 B
1K04			V	V	CON V 11P M 2.00 PH B
2K15	V	V			CER1 0402 NP0 50V 100P COL
3K08	V	V			RST SM 0402 68R PM5 COL
4K02			V	V	RST SM 0603 JUMP. 0R05 COL
4K06		V			RST SM 0402 JUMP. 0R05 COL
5K01	V	V		V	FXDIND SM 0603 1U PM10 COL R

B18 ADC

Item	non-DVB sets with 3D Comb Filter	DVB sets with 3D Comb Filter	Description
3L38		V	RST SM 0402 JUMP. 0R05 COL
4L05		V	RST SM 0402 JUMP. 0R05 COL
5L04		V	RST SM 0603 JUMP. 0R05 COL

B20 & B21 PIXEL PLUS

Item	LC4.3 non PIXEL+	LC4.3 with PIXEL+	42PF7320/28	LC4.8/LC4.9 non PIXEL+	LC4.8/LC4.9 with PIXEL+	Description
1N02		V	V		V	CON V 4P M 2.00 SM PH R
1N05		V	V		V	OSC XTL SM 14M31818 15P OC R
1P06	V	V				CON V 30P M 1.25 SM 1453230 R
1P07			V	V	V	CON H 31P F 1.25 SM FI-WE R
2N01		V	V		V	CER2 0402 Y5V 16V 100N COL
2N02		V	V		V	CER2 0402 Y5V 16V 100N COL
2N03		V	V		V	CER2 0402 X5R 6V3 1U PM20 R
2N04		V	V		V	CER2 0402 X7R 50V 1N COL
2N05		V	V		V	CER2 0402 Y5V 16V 100N COL
2N06		V	V		V	CER2 0402 Y5V 16V 100N COL
2N07		V	V		V	CER2 0402 Y5V 16V 100N COL
2N08		V	V		V	CER2 0402 Y5V 16V 100N COL
2N09		V	V		V	CER2 0402 Y5V 16V 100N COL
2N10		V	V		V	CER2 0402 Y5V 16V 100N COL
2N11		V	V		V	CER1 0402 NP0 50V 100P COL
2N12		V	V		V	CER1 0402 NP0 50V 100P COL
2N13		V	V		V	CER1 0402 NP0 50V 100P COL
2N14		V	V		V	CER1 0402 NP0 50V 100P COL
2N15		V	V		V	CER1 0402 NP0 50V 100P COL
2N16		V	V		V	CER1 0402 NP0 50V 100P COL
2P01		V	V		V	CER2 0603 X5R 6V3 2U2 PM10 R
2P02		V	V		V	CER2 0402 Y5V 16V 100N COL
2P03		V	V		V	CER2 0402 Y5V 16V 100N COL
2P04		V	V		V	CER2 0402 Y5V 16V 100N COL
2P05		V	V		V	CER2 0402 Y5V 16V 100N COL
2P06		V	V		V	CER2 0402 Y5V 16V 100N COL
2P07		V	V		V	CER2 0402 Y5V 16V 100N COL
2P08		V	V		V	CER2 0402 Y5V 16V 100N COL
2P09		V	V		V	CER2 0402 Y5V 16V 100N COL
2P10		V	V		V	CER2 0402 Y5V 16V 100N COL
2P11		V	V		V	CER2 0402 Y5V 16V 100N COL
2P12		V	V		V	CER2 0402 Y5V 16V 100N COL
2P13		V	V		V	CER2 0402 Y5V 16V 100N COL
2P14		V	V		V	CER2 0402 Y5V 16V 100N COL
2P15		V	V		V	ELCAP SM 16V 100U PM20 COL R
2P16		V	V		V	CER2 0402 Y5V 16V 100N COL
2P17		V	V		V	CER2 0603 X5R 6V3 2U2 PM10 R
2P18		V	V		V	CER2 0603 X5R 6V3 2U2 PM10 R
2P19		V	V		V	CER2 0402 Y5V 16V 100N COL
2P20		V	V		V	CER2 0402 Y5V 16V 100N COL
2P21		V	V		V	CER2 0402 Y5V 16V 100N COL
2P22		V	V		V	CER2 0603 X5R 6V3 2U2 PM10 R
2P23		V	V		V	CER2 0402 Y5V 16V 100N COL
2P24		V	V		V	CER2 0402 Y5V 16V 100N COL
2P25		V	V		V	CER2 0402 Y5V 16V 100N COL
2P26		V	V		V	CER2 0402 Y5V 16V 100N COL
2P27		V	V		V	CER2 0402 Y5V 16V 100N COL
2P28		V	V		V	CER2 0402 Y5V 16V 100N COL
2P29		V	V		V	CER2 0402 Y5V 16V 100N COL
2P30		V	V		V	CER2 0402 Y5V 16V 100N COL
2P31		V	V		V	CER2 0402 Y5V 16V 100N COL
2P32		V	V		V	CER2 0402 Y5V 16V 100N COL
2P33		V	V		V	CER2 0402 Y5V 16V 100N COL
2P34		V	V		V	CER2 0402 Y5V 16V 100N COL
2P35		V	V		V	CER2 0402 Y5V 16V 100N COL
3N01		V	V		V	RST SM 0402 10K PM5 COL
3N02		V	V		V	RST SM 0402 10K PM5 COL
3N03		V	V		V	RST SM 0402 10K PM5 COL
3N04		V	V		V	RST SM 0402 10K PM5 COL
3N05		V	V		V	RST SM 0402 10K PM5 COL
3N06		V	V		V	RST SM 0402 10K PM5 COL
3N07		V	V		V	RST SM 0603 33K PM5 COL
3N08		V	V		V	RST SM 0402 10K PM5 COL
3N09		V	V		V	RST SM 0402 1K PM5 COL
3N10		V	V		V	RST SM 0402 33K PM5 COL
3N11		V	V		V	RST SM 0402 47R PM5 COL
3N12		V	V		V	RST SM 0402 10K PM5 COL
3N13		V	V		V	RST SM 0402 10K PM5 COL
3N14		V	V		V	RST SM 0402 10K PM5 COL
3N15		V	V		V	RST SM 0402 47R PM5 COL
3N16		V	V		V	RST SM 0402 47R PM5 COL
3N17		V	V		V	RST SM 0402 47R PM5 COL
3N18		V	V		V	RST SM 0402 47R PM5 COL
3N19		V	V		V	RST SM 0402 10K PM5 COL
3N20		V	V		V	RST SM 0402 47R PM5 COL
3N21		V	V		V	RST SM 0402 100R PM5 COL
3N22		V	V		V	RST SM 0402 100R PM5 COL
3N23		V	V		V	RST SM 0402 100R PM5 COL
3N24		V	V		V	RST SM 0402 100R PM5 COL
3N25		V	V		V	RST SM 0402 100R PM5 COL
3N26		V	V		V	RST SM 0402 4K7 PM5 COL
3N27		V	V		V	RST SM 0402 47R PM5 COL
3N28		V	V		V	RST SM 0603 180R PM5 COL
3N29		V	V		V	RST SM 0402 100R PM5 COL
3N30		V	V		V	RST SM 0402 100R PM5 COL
3N31		V	V		V	RST SM 0402 100R PM5 COL
3N32		V	V		V	RST SM 0402 100R PM5 COL
3N33		V	V		V	RST SM 0402 100R PM5 COL
3N34		V	V		V	RST SM 0402 100R PM5 COL
3N35		V	V		V	RST SM 0402 100R PM5 COL
3N46		V	V		V	RST SM 0402 100R PM5 COL
3N47		V	V		V	RST SM 0402 100R PM5 COL
3P01		V	V		V	RST SM 0402 4K7 PM5 COL
3P03		V	V		V	RST SM 0402 47R PM5 COL
3P04				V		RST SM 0402 100R PM5 COL
3P04					V	RST SM 0402 JUMP. 0R05 COL
3P05				V		RST SM 0402 100R PM5 COL
3P05					V	RST SM 0402 JUMP. 0R05 COL
4N01	V			V		RST SM 0402 JUMP. 0R05 COL
4N02	V			V		RST SM 0402 JUMP. 0R05 COL
4N03	V			V		RST SM 0402 JUMP. 0R05 COL
4N04	V			V		RST SM 0402 JUMP. 0R05 COL
4N05	V			V		RST SM 0402 JUMP. 0R05 COL
4N06	V			V		RST SM 0402 JUMP. 0R05 COL
4N07	V			V		RST SM 0402 JUMP. 0R05 COL
4N08	V			V		RST SM 0402 JUMP. 0R05 COL
4N09	V			V		RST SM 0402 JUMP. 0R05 COL
4N10	V			V		RST SM 0402 JUMP. 0R05 COL
4N11	V			V		RST SM 0402 JUMP. 0R05 COL
4N12	V			V		RST SM 0402 JUMP. 0R05 COL
4N13	V			V		RST SM 0402 JUMP. 0R05 COL
4N14	V			V		RST SM 0402 JUMP. 0R05 COL
4N15	V			V		RST SM 0402 JUMP. 0R05 COL
4N16	V			V		RST SM 0402 JUMP. 0R05 COL
4N17	V			V		RST SM 0402 JUMP. 0R05 COL
4N18	V			V		RST SM 0402 JUMP. 0R05 COL
4N19	V			V		RST SM 0402 JUMP. 0R05 COL
4N20	V			V		RST SM 0402 JUMP. 0R05 COL
4N21		V	V		V	RST SM 0402 JUMP. 0R05 COL
4N22		V	V		V	RST SM 0402 JUMP. 0R05 COL
4P01						RST SM 0402 JUMP. 0R05 COL
4P02						RST SM 0402 JUMP. 0R05 COL
4P07				V		RST SM 0402 JUMP. 0R05 COL
5N01		V	V		V	FXDIND 0805 100MHZ 30R COL R
5N02		V	V		V	FXDIND 0805 100MHZ 30R COL R
5N03		V	V		V	FXDIND 0805 100MHZ 30R COL R
5N04		V	V		V	FXDIND 0805 100MHZ 30R COL R
5N05		V	V		V	FXDIND 0805 100MHZ 30R COL R
5P01		V	V		V	FXDIND 0805 100MHZ 30R COL R
5P02		V	V		V	FXDIND 0805 100MHZ 30R COL R
5P03		V	V		V	FXDIND 0805 100MHZ 30R COL R
5P04		V	V		V	FXDIND 0805 100MHZ 30R COL R
5P05		V	V		V	FXDIND 0805 100MHZ 30R COL R
5P06		V	V		V	FXDIND 0805 100MHZ 30R COL R
6N01		V	V		V	LED VS SM TLMG3100 (VISH) R
7N01		V	V		V	IC SM EPCS4SI8N (ALT0) R
7N02		V	V		V	IC SM EP1C12F256C8N (ALT0) Y
7N03		V	V		V	TRA SIG SM BC847BS (PHSE) R
7N04		V	V		V	IC SM THC63LVDF84B (THIN) R
7P01		V	V		V	IC SM LF15ABDT (ST00) R
7P02		V	V		V	IC SM THC63LVDM83R (THIN) R

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240505

Layout Small Signal Board (Top Side Overview)

1101	D2
1104	B1
1106	B1
1107	D2
1751	A5
1802	B6
1C00	C5
1N01	A7
1N02	B7
1N03	A7
1N05	A7
2101	C1
2102	C1
2103	C2
2104	D1
2105	D1
2106	C2
2107	C1
2108	C1
2109	D1
2110	C2
2111	C2
2112	C2
2113	C2
2114	C2
2201	A2
2202	A2
2219	B2
2220	B2
2225	A2
2227	A2
2239	A3
2252	B3
2253	B2
2254	B2
2273	A3
2280	A2
2281	A2
2282	B3
2283	B3
2284	B3
2292	B3
2293	B2
2449	C3
2603	A1
2604	A1
2605	A2
2608	A2
2609	A1
2610	A2
2612	A2
2613	A1
2614	A2
2616	A1
2617	A1
2619	A2
2700	A6
2701	A6
2708	A5
2710	A4
2711	A4
2714	A5
2715	A5
2730	A4
2733	A3
2734	A3
2735	A3
2741	B3
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7G05	D5
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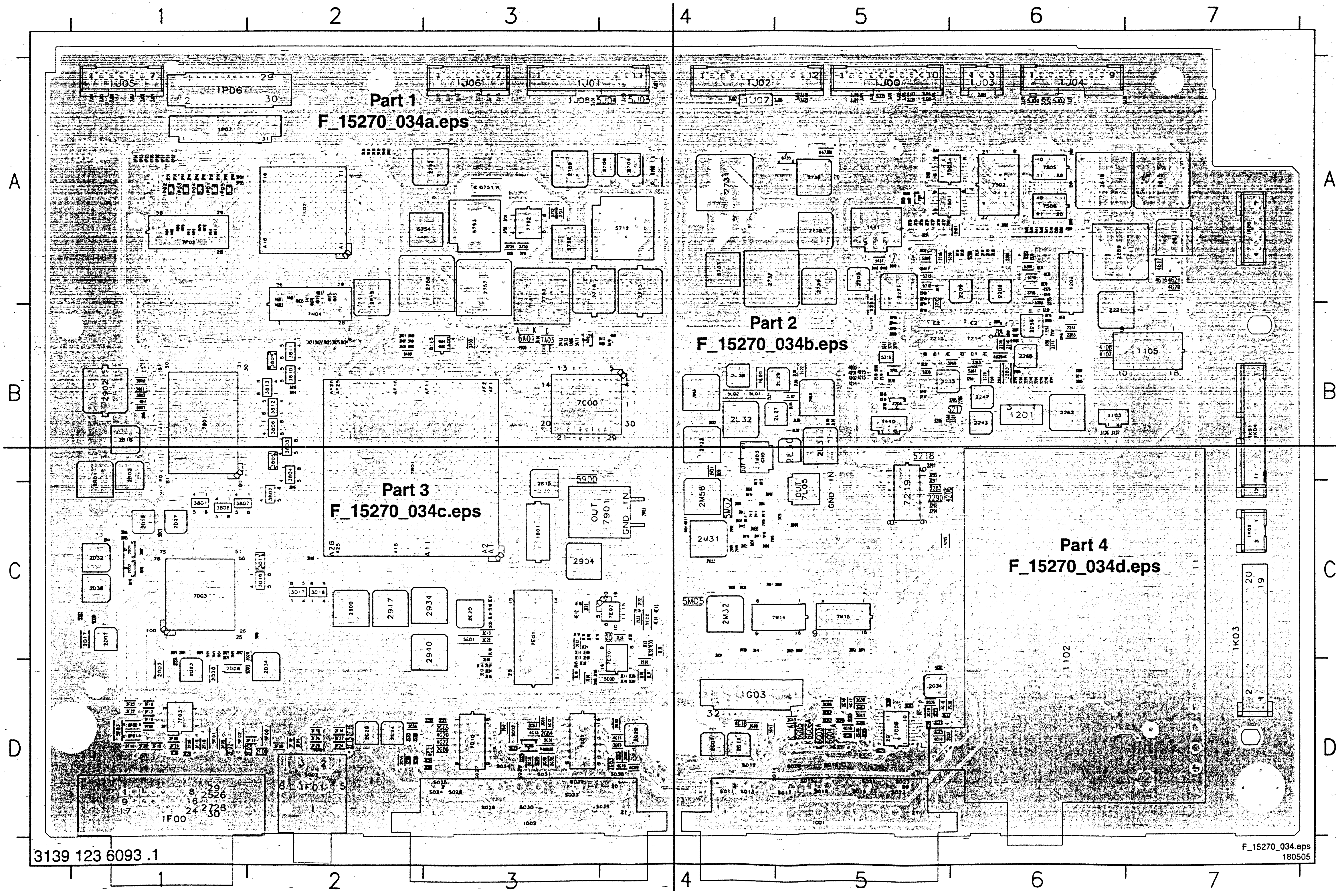
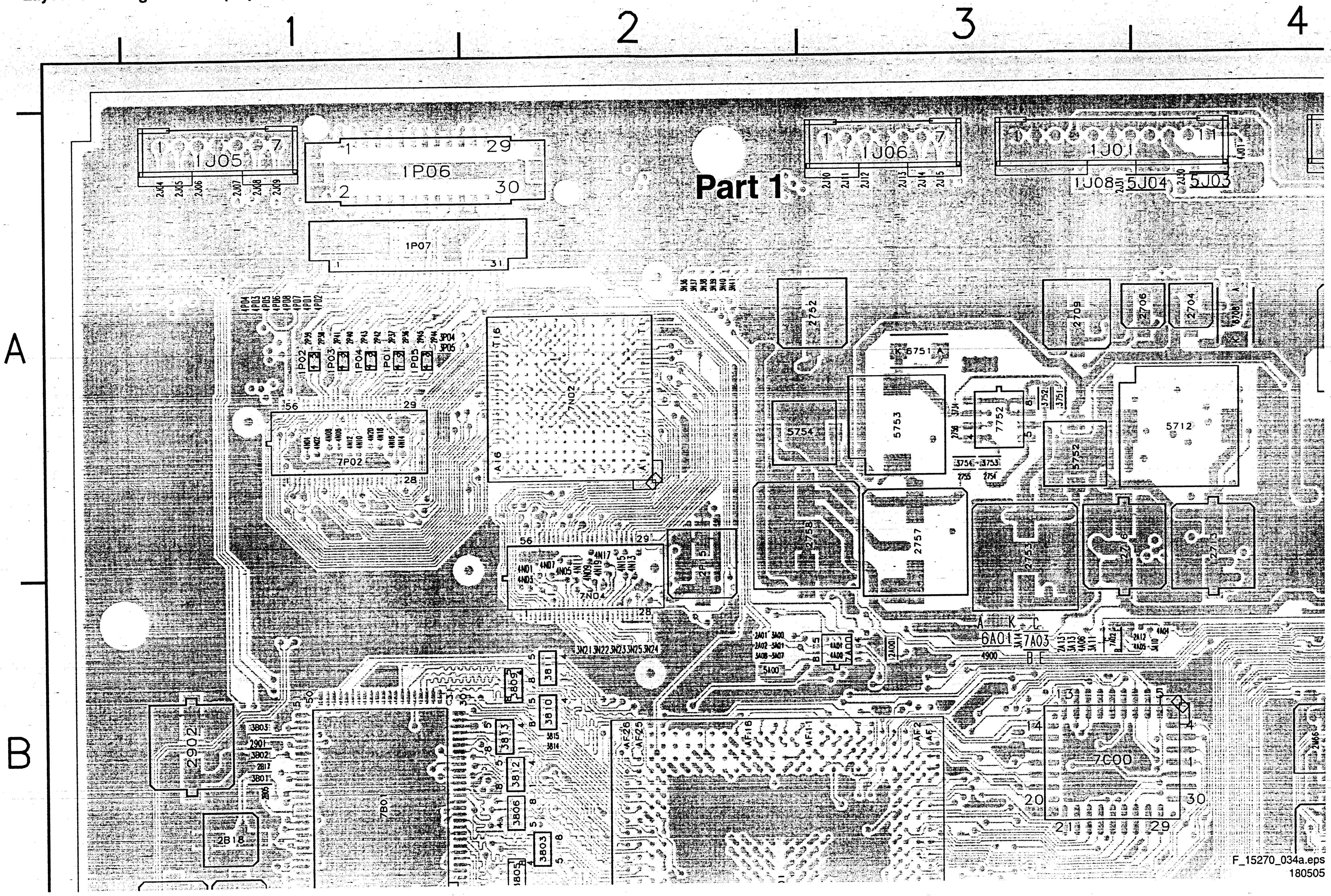


Layout Small Signal Board (Top Side Part 1)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B
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2715
7N02
7P02
7N04
6A01
7A03
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2B18
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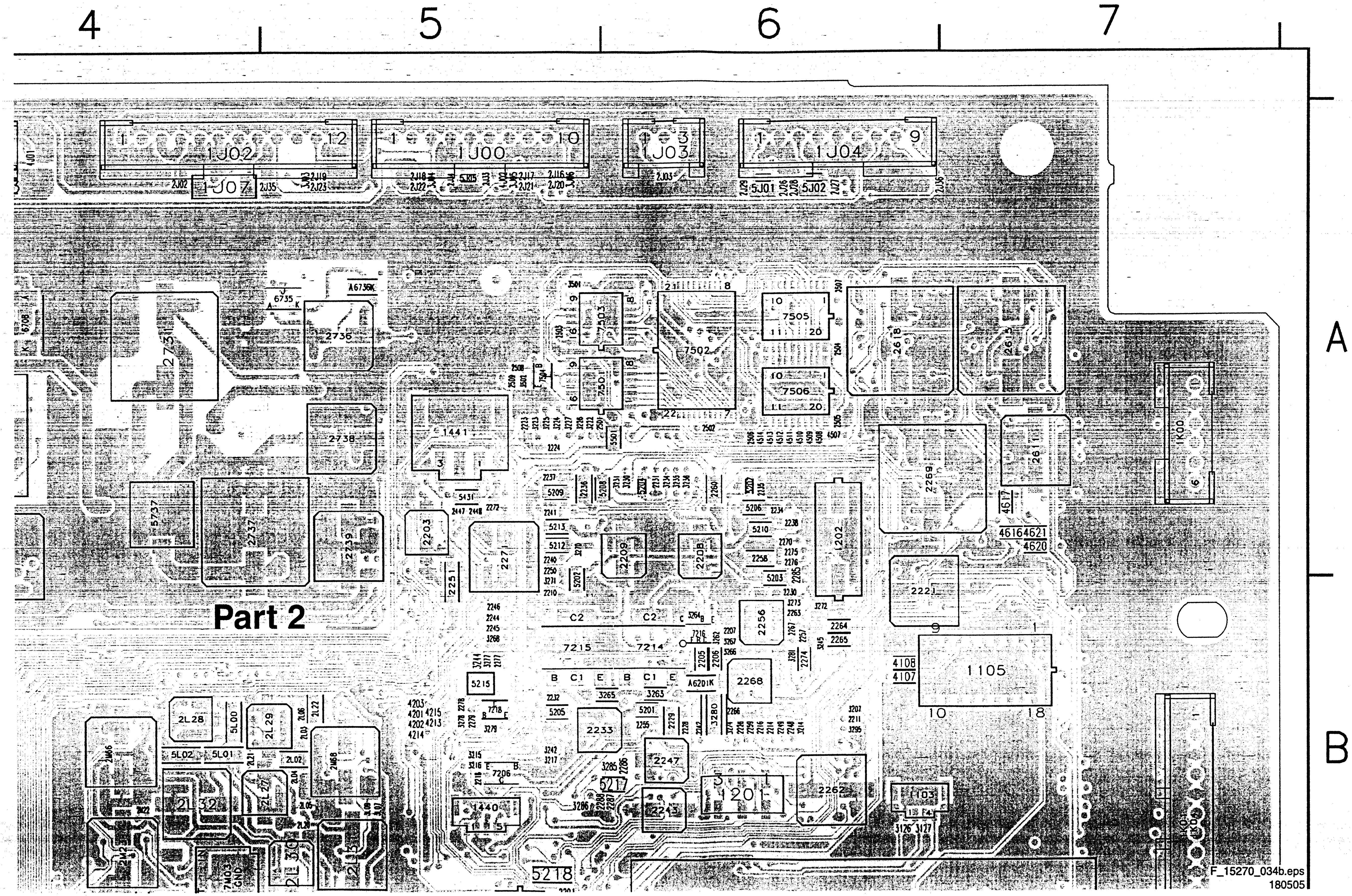
180505

Layout Small Signal Board (Top Side Part 2)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2J18
2J22
5J05
2J17
2J21
2J16
2J20
2J03
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5J02
2J06
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2269
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1202
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C2
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B C1 E B C1 E
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1201
2262
1103
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3127
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Part 2
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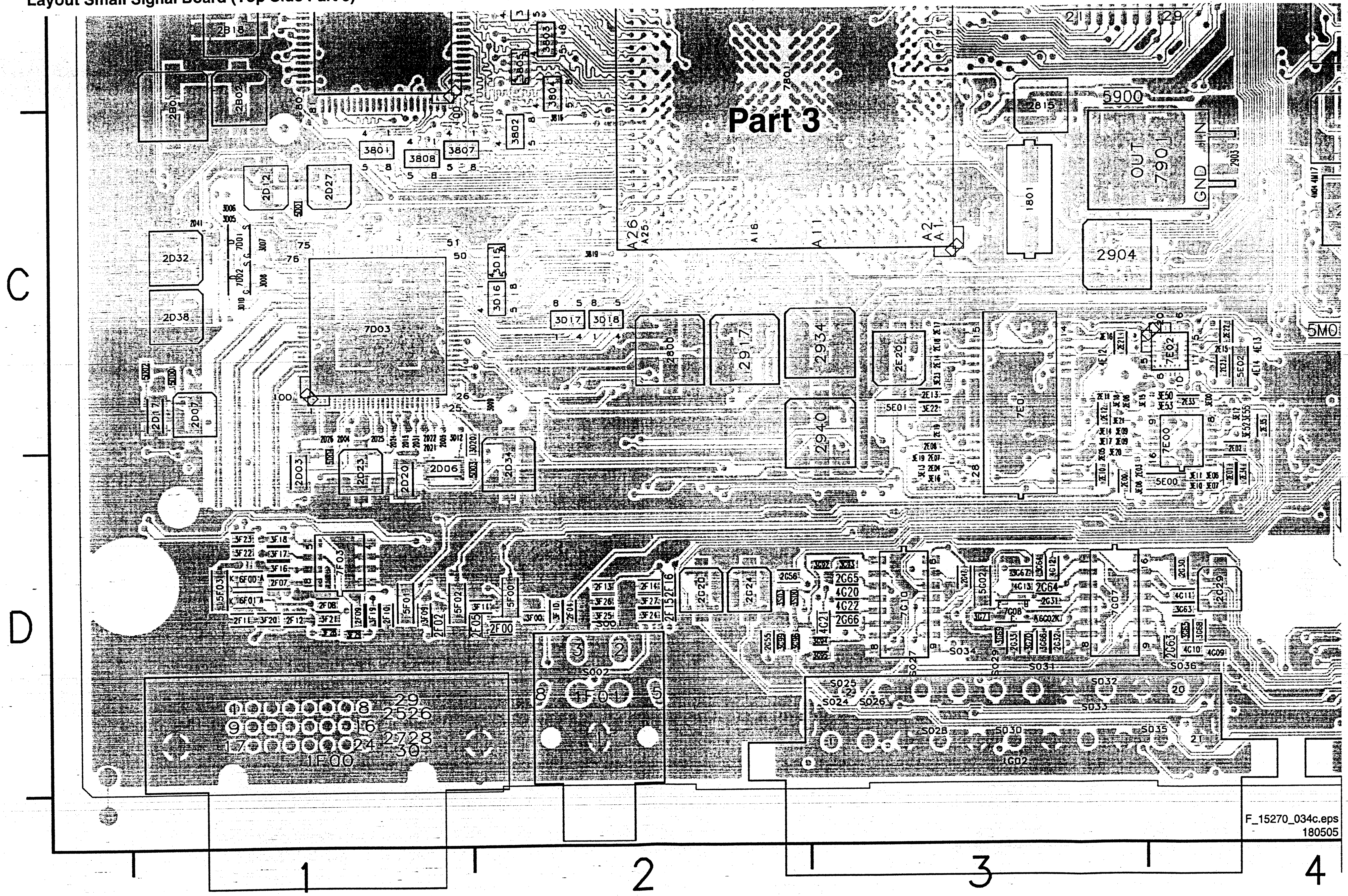
Layout Small Signal Board (Top Side Part 3)


Part 3
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1F00
1F01
1C02
2D32
2D38
2D12
2D27
2B01
2B02
2B18
2B15
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2940
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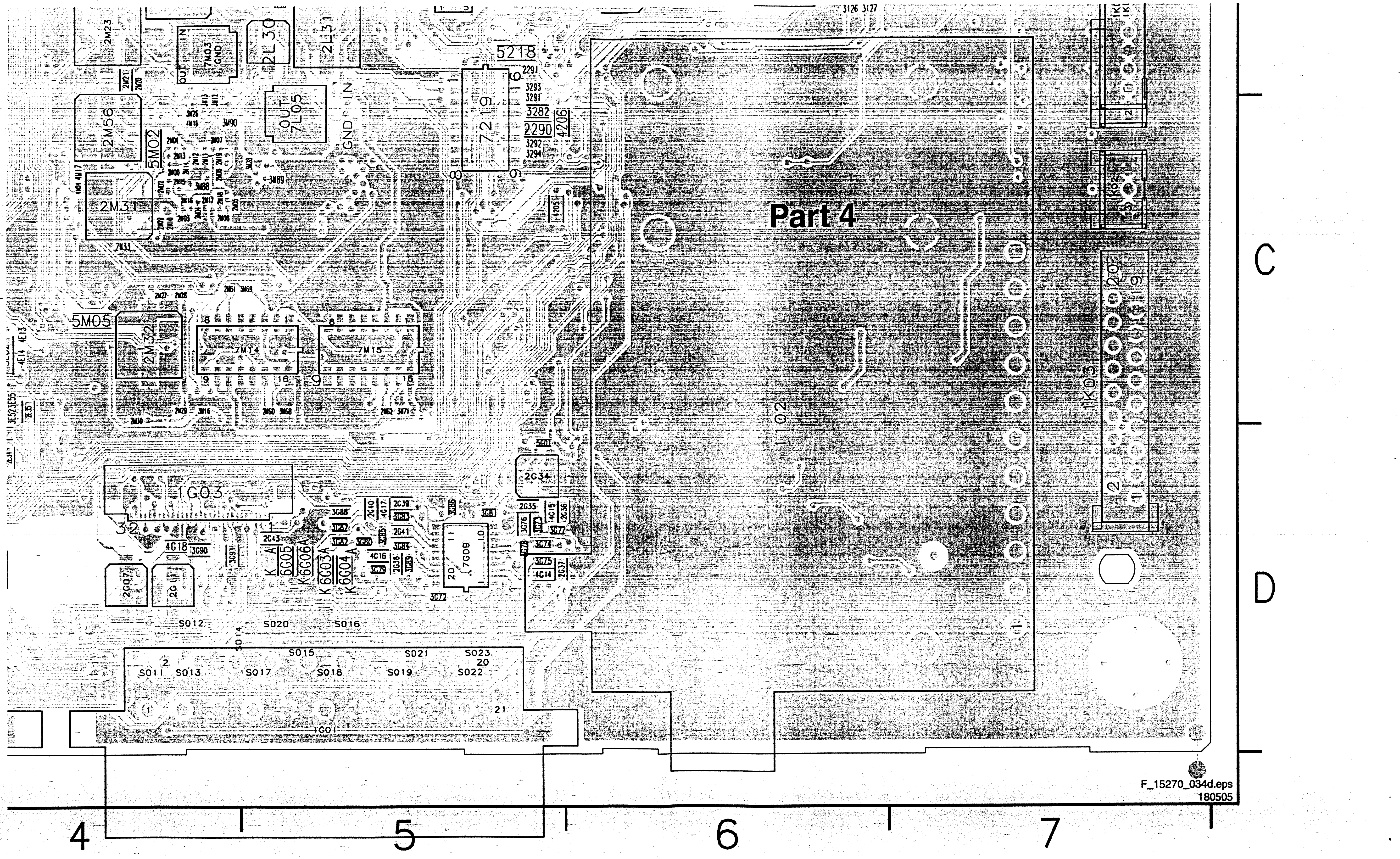
2D34
2D17
2D07
2C65
4C20
4C22
2G66
2C64
2C29
2C63
S002
S024
S025
S026
S027
S028
S029
S030
S031
S032
S033
S034
S035
S036
OUT
GND
IN
A26
A25
A16
A11
A2
A1

F_15270_034c.eps
180505

Layout Small Signal Board (Top Side Part 4)


Part 4
2M23
7M03
2L30
2L31
5218
7219
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2M56
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2M31
5M05
2M32
7M14
7M15
1G03
2G34
7G09
6G05
6G06A
6G03A
6G04A
4G18
3G90
2G07
1K03
1K02
1C01
S011
S012
S013
S014
S015
S016
S017
S018
S019
S020
S021
S022
S023
C
D
4
5
6
7

F_15270_034d.eps
180505

Layout Small Signal Board (Bottom Side Overview)

1102	C6
1103	B6
1105	B7
1201	B6
1202	A6
1440	B5
1441	A5
1801	C3
1F00	D1
1F01	D2
1G01	D5
1G02	D3
1G03	D4
1J00	A5
1J01	A3
1J02	A4
1J03	A6
1J04	A6
1J05	A1
1J06	A3
1J07	A4
1J08	A3
1K00	A7
1K01	B7
1K02	C7
1K03	C7
1K04	B7
1P01	A1
1P02	A1
1P03	A1
1P04	A1
1P05	A1
1P06	A1
1P07	A1
2203	A5
2205	B6
2206	B6
2207	B6
2208	A6
2209	A6
2210	B5
2211	B6
2214	B6
2216	B6
2218	B5
2221	B6
2223	A5
2224	A5
2226	B6
2228	B6
2229	B6
2230	B6
2231	A6
2232	B5
2233	B5
2234	A6
2235	A6
2236	A5
2237	A5
2238	A6
2240	A5
2241	A5
2242	B6
2243	B6
2244	B5
2245	B5
2246	B5
2247	B6
2248	B6
2249	B6
2250	A5
2251	B5
2255	B6
2256	B6
2257	B6
2258	A6
2259	B6
2260	A6
2262	B6
2263	B6
2264	B6
2265	B6
2266	B6
2267	B6
2268	B6
2269	A6
2270	A6
2271	A5
2272	A5
2274	B6
2275	A6
2276	A6
2277	B5
2278	B5
2279	B5
2285	A6
2286	B6
2287	B6
2288	B5
2290	C5
2291	B5
2447	A5
2448	A5
2501	A5
2502	A6
2503	A5
2504	A6
2505	A6
2506	A6
2507	A6
2508	A5
2509	A5
2611	A7
2615	A7
2618	A6
2704	A4
2706	A4
2709	A3
2713	A4
2716	A3
2731	A4
2736	A5
2737	A4
2738	A5
2739	A5
2752	A3
2753	A3
2754	A3
2755	A3
2756	A3
2757	A3
2758	A3
2800	C2
2815	C3
2901	B1
2902	B1
2903	C4
2904	C3
2817	C2
2934	C3
2940	C3
2A00	B3
2A01	B2
2A02	B2
2A12	B4
2A13	B3
2B01	B1
2B02	B1
2B05	B1
2B17	B1
2B18	B1
2D03	D1
2D04	C1
2D05	C1
2D06	D1
2D07	C1
2D12	C1
2D15	C1
2D17	C1
2D20	D1
2D21	C1
2D22	C1
2D23	D1
2D24	C1
2D25	C1
2D26	C1
2D27	C1
2D31	C1
2D32	C1
2D34	D2
2D38	C1
2D41	C1
2E00	D3
2E01	D4
2E02	D4
2E03	D3
2E04	D3
2E05	D3
2E06	C3
2E07	D3
2E08	D3
2E09	C3
2E10	D3
2E11	C3
2E12	C3
2E13	C3
2E14	C3
2E15	C4
2E16	C3
2E17	C3
2E18	C3
2E19	C3
2E20	C3
2E21	C3
2E22	C4
2E23	C4
2E33	C4
2E34	D4
2E35	C4
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2F02	D1
2F04	D2
2F05	D2
2F07	D1
2F08	D1
2F09	D1
2F10	D1
2F11	D1
2F12	D1
2F13	D2
2F14	D2
2F15	D2
2F16	D2
2G07	D4
2G11	D4
2G20	D2
2G24	D2
2G29	D4
2G30	D4
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2G32	D3
2G33	D3
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2G36	D5
2G37	D5
2G38	D5
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2G40	D5
2G41	D5
2G43	D5
2G47	D3
2G55	D2
2G56	D2
2G63	D4
2G64	D3
2G65	D3
2G66	D3
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2J03	A6
2J04	A1
2J05	A1
2J06	A1
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2J08	A1
2J09	A1
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2J14	A3
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2J20	A5
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2J22	A5
2J23	A5
2J26	A6
2J27	A6
2J28	A6
2J29	A6
2J30	A4
2J31	A3
2J33	A5
2J34	A5
2J35	A5
2J36	A6
2L02	B5
2L03	B5
2L04	B5
2L05	B5
2L06	B5
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2M13	C4
2M14	C4
2M15	C4
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2M17	C4
2M18	C4
2M19	C4
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2M21	B4
2M22	B4
2M23	B4
2M27	C4
2M28	C4
2M29	C4
2M30	C4
2M31	C4
2M32	C4
2M33	C4
2M56	C4
2M60	C5
2M61	C4
2M62	C5
2M66	B4
2M68	B5
2P15	A2
2P36	A1
2P37	A1
2P38	A1
2P39	A1
2P40	A1
2P41	A1
2P42	A1
2P43	A1
2P44	A1
2P45	A1
3126	B6
3127	B6
3207	B6
3214	B6
3215	B5
3216	B5
3217	B5
3222	A5
3223	A5
3224	A5
3225	A5
3226	A5
3227	A5
3230	A6
3231	A6
3234	A6
3235	A6
3236	A6
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3286	B5
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3752	A3
3753	A3
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3805	B2
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3807	C1
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3813	B2
3814	B2
3815	B2
3816	C2
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3A01	B2
3A07	B2
3A08	B2
3A10	B4
3A11	B3
3A13	B3
3A14	B3
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3B02	B1
3B03	B1
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3D06	C1
3D07	C1
3D08	C1
3D09	C2
3D10	C1
3D12	C1
3D15	C2
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3D17	C2
3D18	C2
3D20	C2
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3E07	D4
3E08	D3
3E09	C3
3E10	D4
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3E19	D3
3E20	D3
3E21	C3
3E22	C3
3E23	C3
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3E55	C4
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3F10	D2
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3F18	D1
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3F22	D1
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3F26	D2
3F27	D2
3F28	D1
3F29	D1
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3G65	D4
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3G73	D5
3G74	D5
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3G77	D5
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3G81	D5
3G82	D5
3G83	D5
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3G86	D5
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3G89	D5
3G90	D4
3G91	D4
3G92	D3
3G93	D3
3G94	D3
3G95	D3
3G96	D2
3G99	D2
3J03	A5
3J04	A5
3J05	A5
3J06	A5
3L07	B5
3L09	B5
3M12	C4
3M13	C4
3M16	C4
3M26	C4
3M28	C5
3M68	C5
3M69	C5
3M71	C5
3M88	C4
3M89	C5
3M90	C4
3N21	B2
3N22	B2
3N23	B2
3N24	B2
3N25	B2
3N36	A2
3N37	A2
3N38	A2
3N39	A2
3N40	A2
3N41	A2
3P04	A1
3P05	A1
3S00	D2
3S03	D2
4107	B6
4108	B6
4201	B5
4202	B5
4203	B5
4205	C5
4206	C5
4213	B5
4214	B5
4215	B5
4507	A6
4508	A6
4509	A6
4510	A6
4511	A6
4512	A6
4513	A6
4514	A6
4616	A7
4617	A7
4620	A7
4621	A7
4900	B3
4A00	B3
4A01	B3
4A04	B4
4A05	B4
4A06	B3
4E12	C3
4E13	C4
4E14	C4
4G09	D4
4G10	D4
4G11	D4
4G12	D3
4G13	D3
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4G15	D5
4G16	D5
4G17	D5
4G18	D4
4G20	D3
4G21	D3
4G22	D3
4J01	A4
4J02	A5
4M04	C4
4M16	C4
4M17	C4
4N01	A2
4N02	A1
4N03	B2
4N04	A1
4N05	A2
4N06	A1
4N07	A2
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4N10	A1
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4N13	A2
4N14	A1
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4N16	A1
4N17	A2
4N18	A1
4N19	A2
4N20	A1
4P01	A1
4P02	A1
4P03	A1
4P04	A1
4P05	A1
4P06	A1
4P07	A1
4P08	A1
5201	B6
5202	B5
5203	A6
5204	A6
5205	B5
5206	A6
5207	A6
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5213	A5
5215	B5
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5E00	D4
5E01	C3
5E02	C4
5F00	D2
5F01	D1
5F02	D1
5F03	D1
5G01	D5
5G02	D3
5J01	A6
5J02	A6
5J03	A4
5J04	A4
5J05	A5
5L00	B4
5L01	B4
5L02	B4
5M02	C4
5M05	C4
6201	B6
6708	A4
6735	A5
6736	A5
6751	A3
6A01	B3
6F00	D1
6F01	D1
6G02	D3
6G03	D5
6G04	D5
6G05	D5
6G06	D5
7206	B5
7214	B6
7215	B5
7216	B6
7218	B5
7219	C5
7501	A6
7502	A6
7503	A6
7504	A5
7505	A6
7506	A6
7752	A3
7801	B2
7901	C4
7A00	B3
7A02	B3
7A03	B3
7B01	B1
7C00	B3
7D01	C1
7D02	C1
7D03	C1
7E00	C4
7E01	C3
7E02	C4
7F03	D1
7G07	D3
7G08	D3
7G09	D5
7G10	D3
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7M03	B4
7M14	C5
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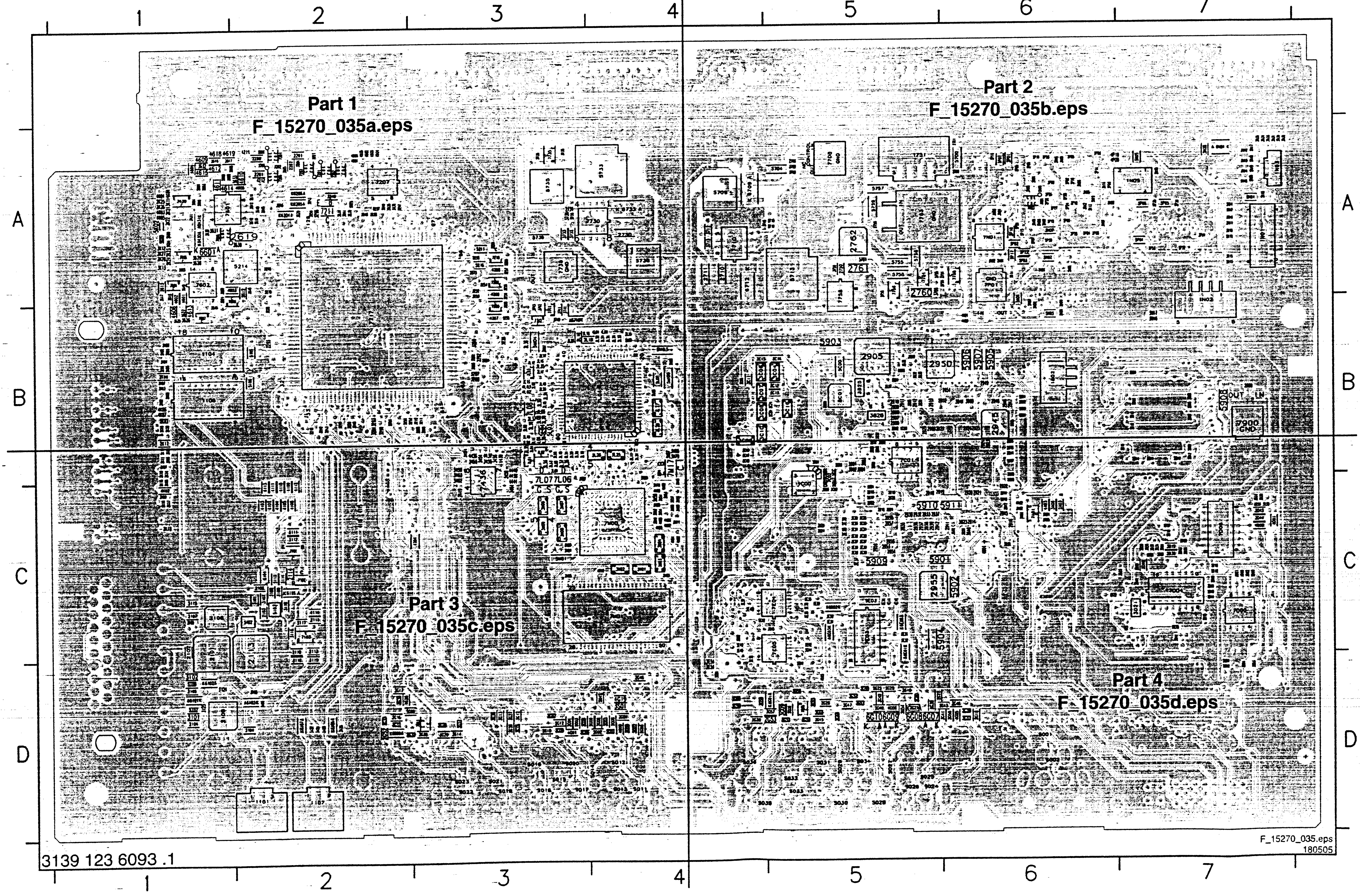
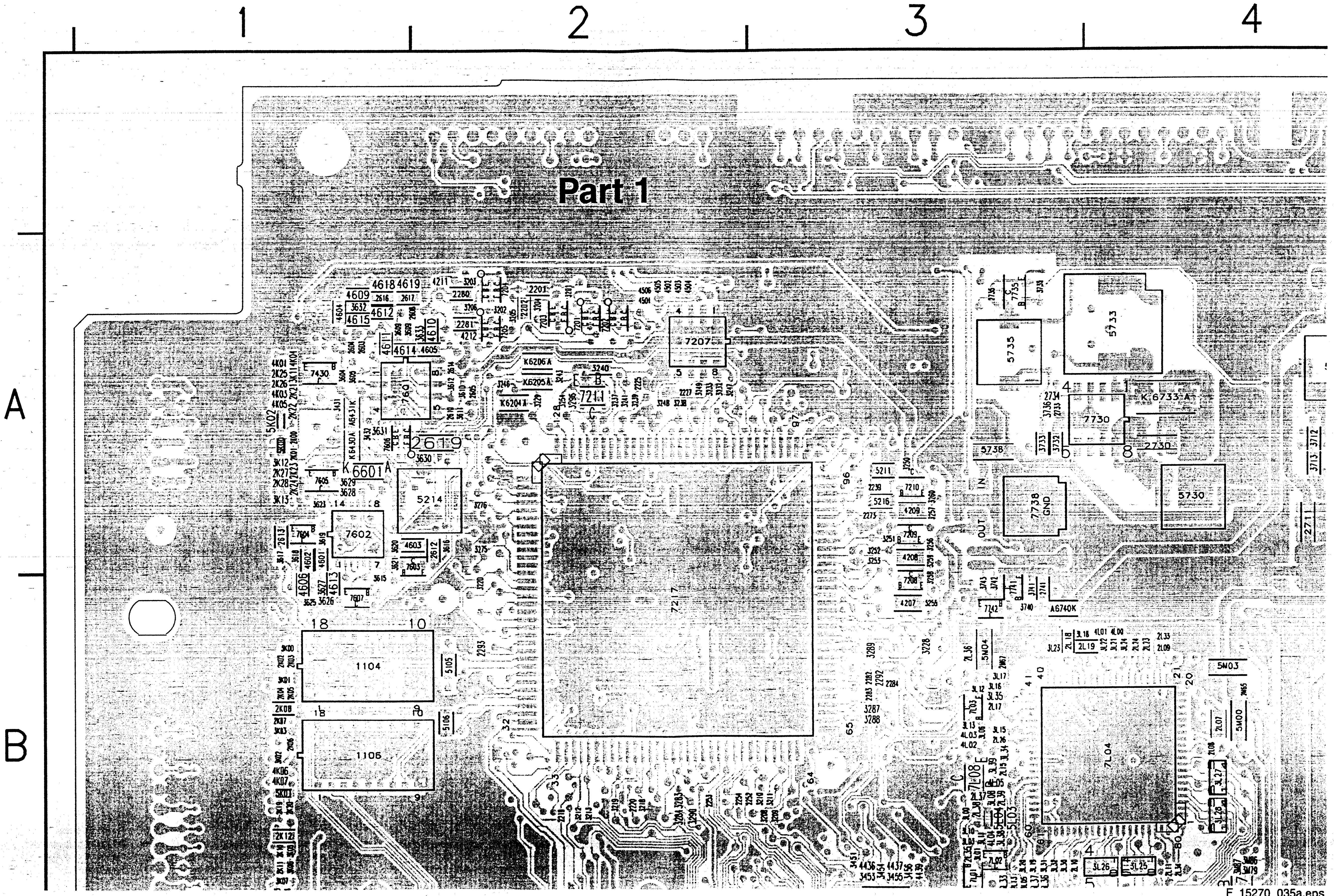
7N02	A2
7N04	B2
7P02	A1



Layout Small Signal Board (Bottom Side Part 1)


1
2
3
4
A
B
Part 1
4618 4619
4609
4612
4615
4610
4614
7430
7601
2619
6601
7605
5214
7602
4603
4606
4613
7607
18
10
1104
1106
9
K6206A
K6205A
K6204A
3240
7211
7207
7217
5211
7210
5216
4209
7209
4208
7208
4207
5735
5733
7730
K6733A
2730
5738
7738
GND
IN
OUT
5730
A6740K
7742
7L04
5M03
5M00
3L26
3L25
2711
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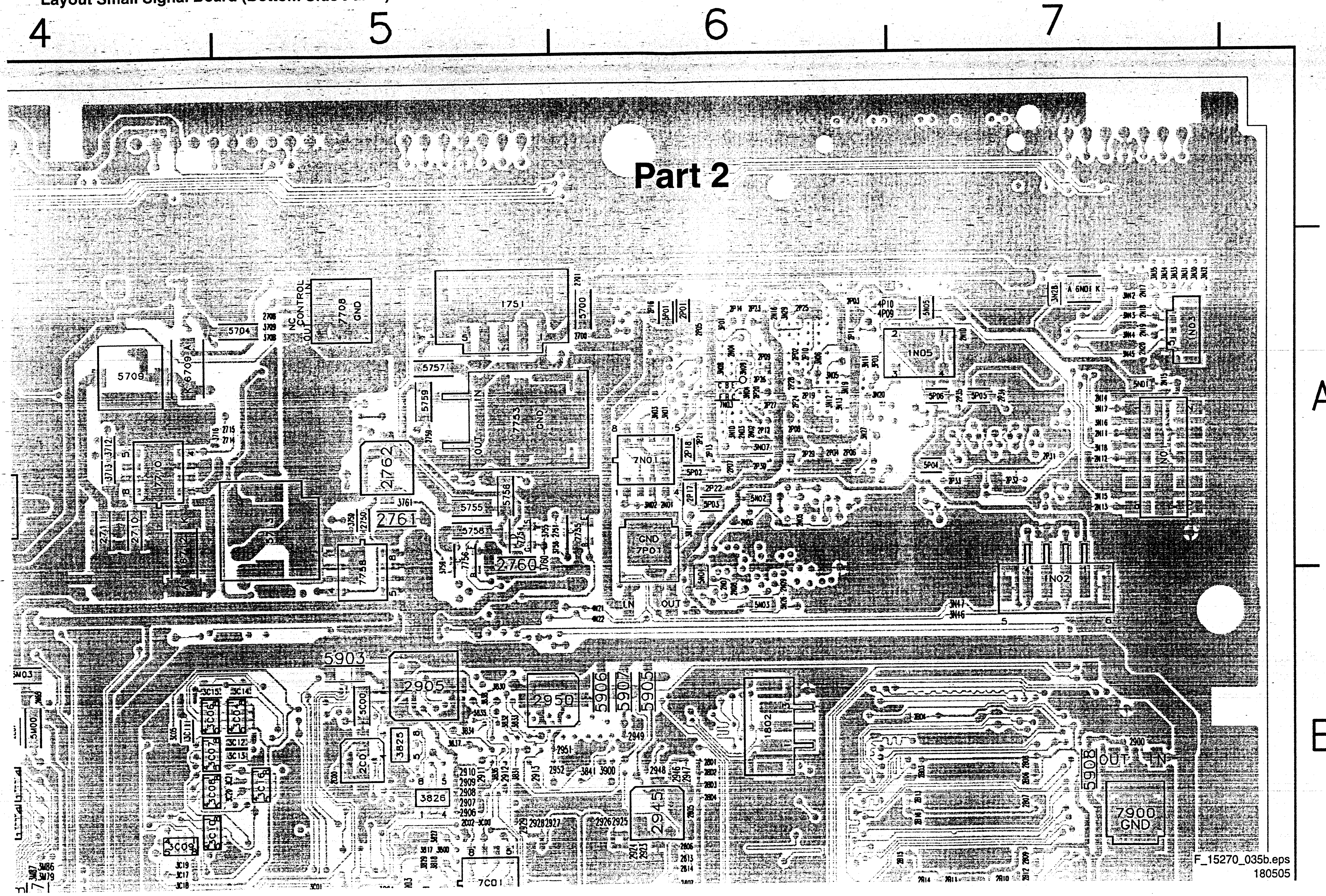
3288
3228
5105
5106
2293

F_15270_035a.eps
180505

Layout Small Signal Board (Bottom Side Part 2)


4
5
6
7
A
B
Part 2
5709
5704
6709
7710
7708
NC
CONTROL
IN
OUT
GND
1751
5700
5757
5759
7733
2762
2761
2760
5755
5758
7758
7N01
7P01
1N05
1N03
1N02
5N01
5N02
5N03
5P01
5P02
5P03
5P04
5P05
A
GND
K
5903
2905
2950
5906
5907
5905
1802
5908
7900
2945
3825
3826
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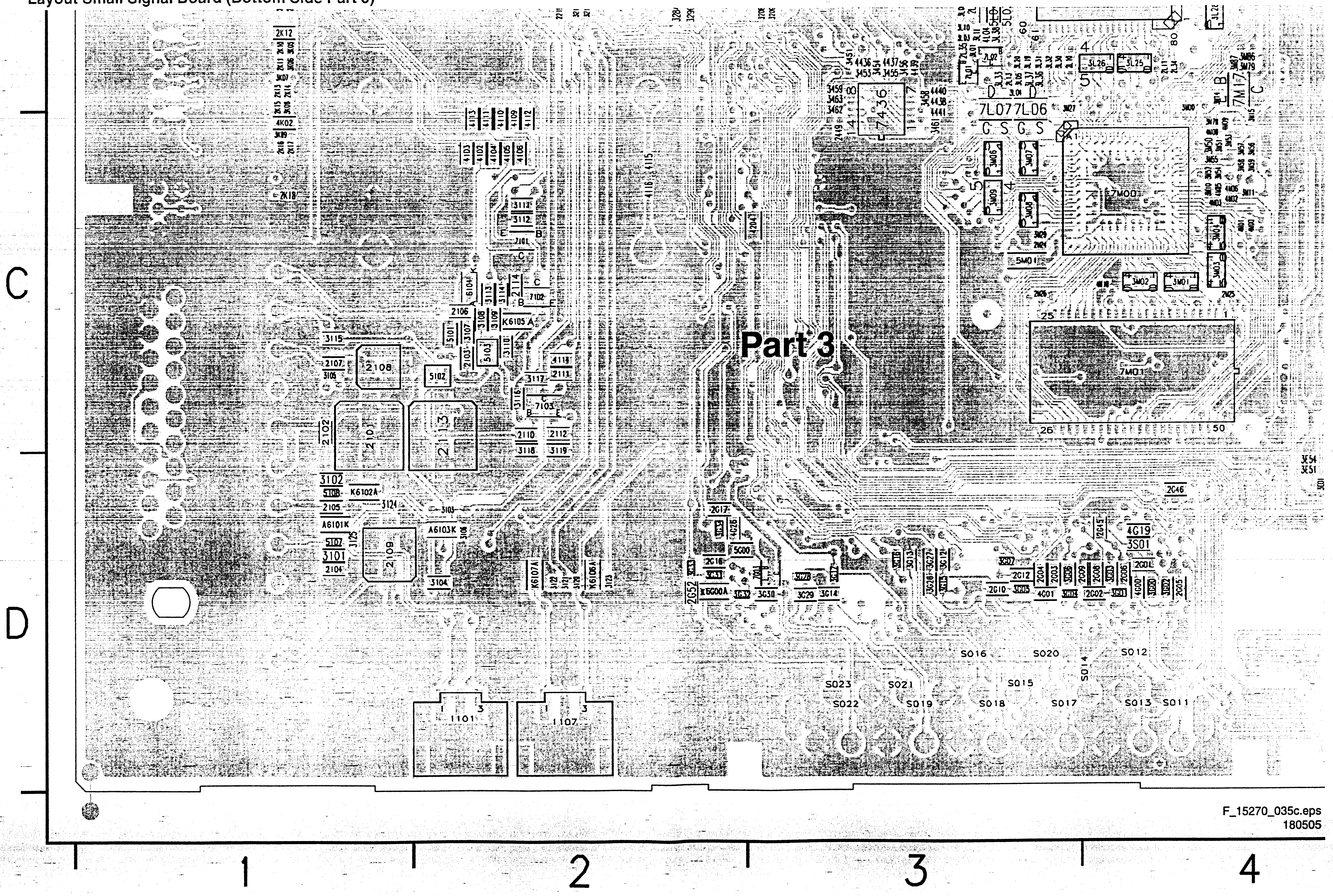
7C01
3C09
5M03
5M00
2900

F_15270_035b.eps
180505

Layout Small Signal Board (Bottom Side Part 3)


C
D
1
2
3
4
Part 3
2K12
4K02
2K18
4113
4111
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4109
4112
4103
4102
4104
4105
4106
4116
4115
3112
3111
7101
2114
7102
6104
3113
3114
2106
3108
3109
K6105 A
3115
5101
3107
2103
5103
3110
2107
3106
2108
5102
4118
3117
2111
3116
7103
2102
2101
2113
2110
2112
3118
3119
3102
5108
K6102A
2105
3124
3105
A6101K
A6103K
5107
3101
3125
2109
2104
3104
K6107A
K6106A
3123
1101
1107
3459
3463
3462
7436
4436
4437
4440
4438
4441
3451
3453
3455
3456
3458
3461
7L07
7L06
G S G S
3L26
3L25
3M06
3M07
3M09
3M08
7M00
3M03
3M02
3M01
5M01
7M01
7M17
4G19
3S01
2G17
2G16
5G00
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K5G00A
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3G29
3G14
3G27
2G12
2G10
2G04
2G03
4G01
2G02
2G05
2C46
3E54
3E51
25
26
50
80
S016
S020
S012
S014
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S018
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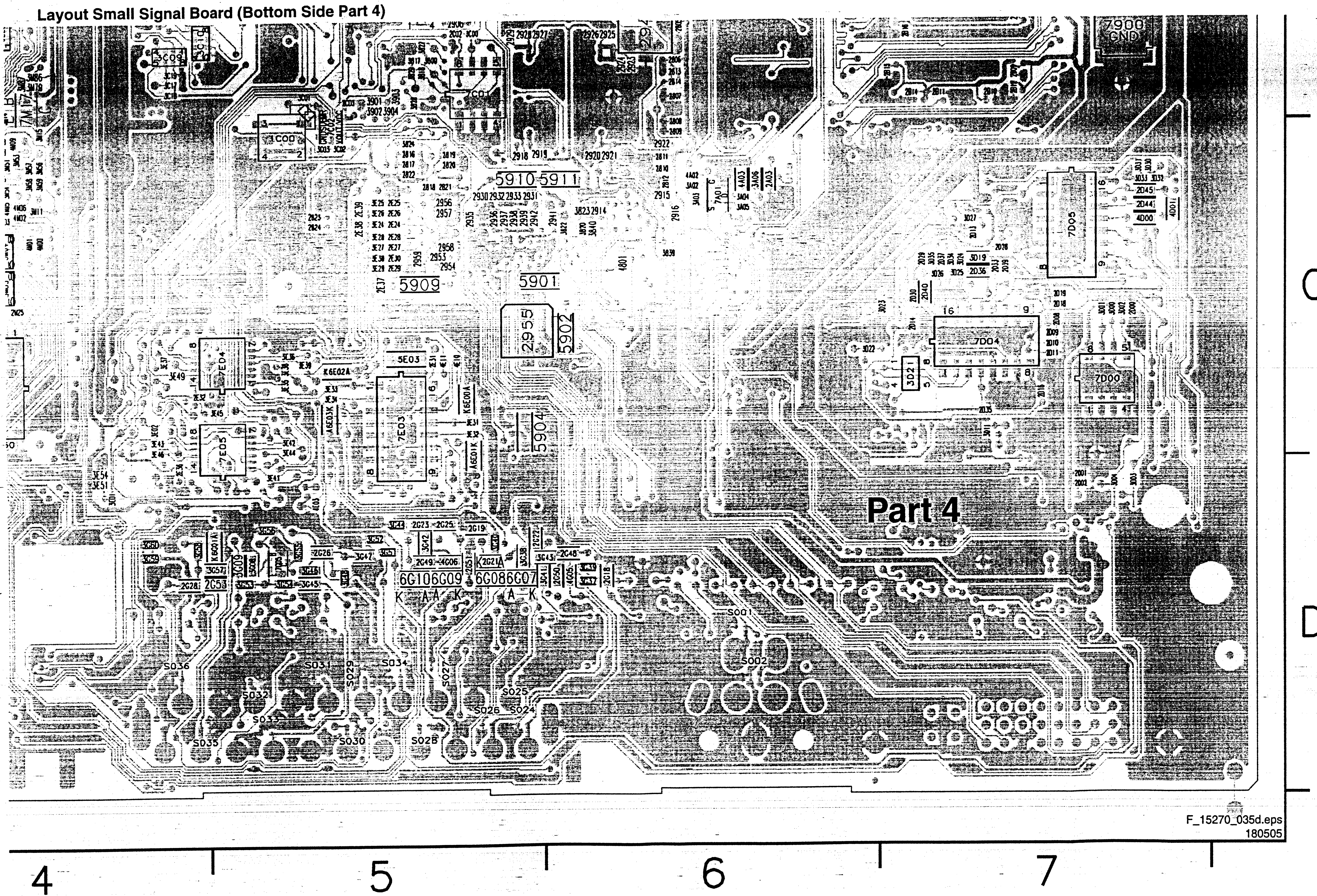
S013
S011

F_15270_035c.eps
180505

Layout Small Signal Board (Bottom Side Part 4)


Part 4
C
D
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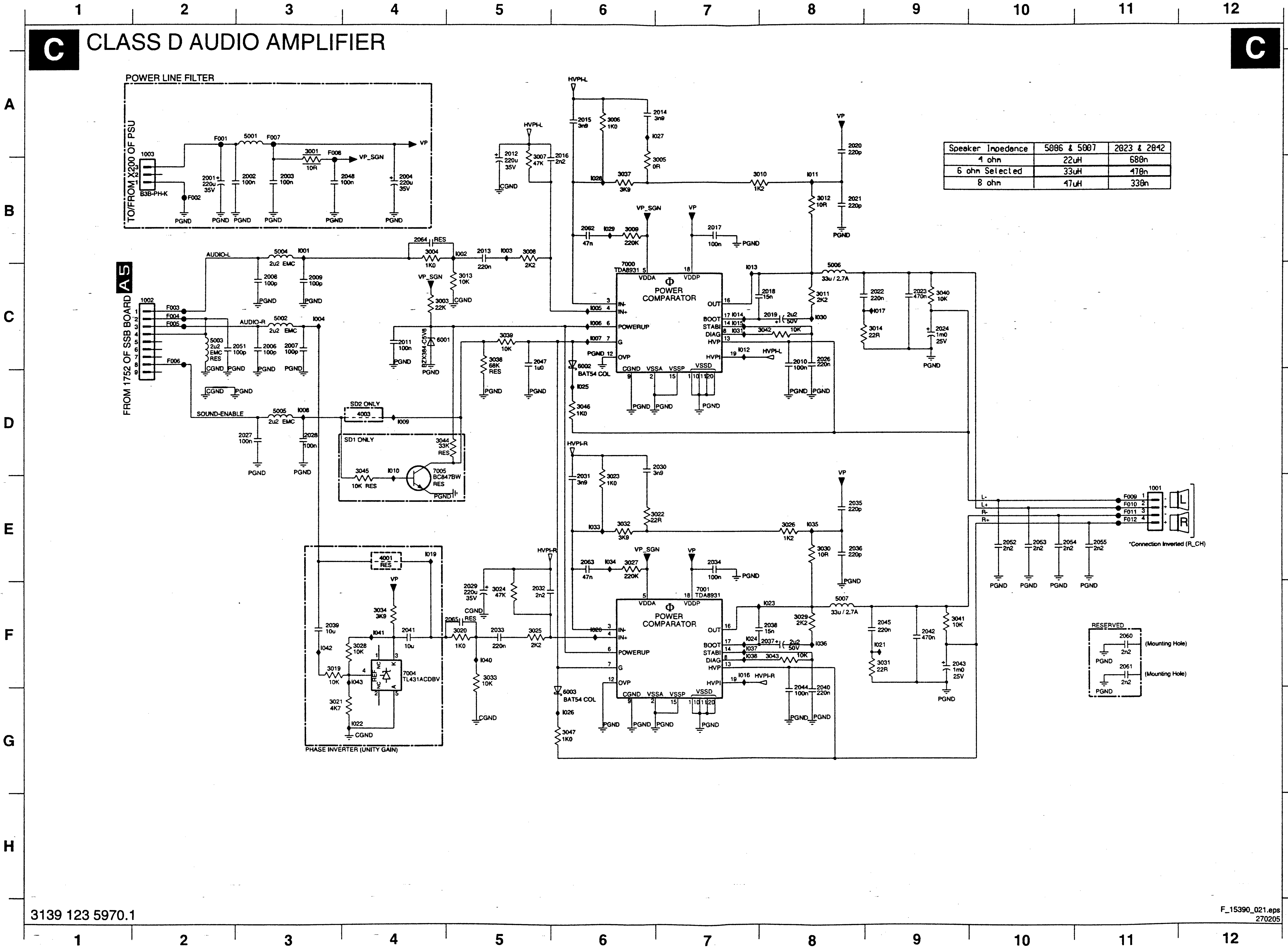
5
6
7
7900 GND
7C01
1C00
5910 5911
5909
5901
2955
5902
5904
7E04
7E05
7E03
5E03
7D05
7D04
7D00
3D21
6G10 6G09
6G08 6C07
S001
S002
S024
S025
S026
S027
S028
S029
S030
S031
S032
S033
S034
S035
S036

F_15270_035d.eps
180505

Class D Audio Amplifier


C
CLASS D AUDIO AMPLIFIER
POWER LINE FILTER
TO/FROM X200 OF PSU
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B3B-PH-K
F001
5001
F007
VP
3001
10R
F006
VP_SGN
F002
2001 220u 35V
2002 100n
2003 100n
2048 100n
2004 220u 35V
PGND
FROM 1752 OF SSB BOARD
A5
1002
F003
F004
F005
F006
AUDIO-L
5004 2u2 EMC
I001
2008 100p
2009 100p
AUDIO-R
5002 2u2 EMC
I004
5003 2u2 EMC RES
2051 100p
2006 100p
2007 100p
CGND
SOUND-ENABLE
5005 2u2 EMC
I008
2027 100n
2028 100n
SD2 ONLY
4003
I009
SD1 ONLY
3044 33K RES
3045 10K RES
I010
7005 BC847BW RES
2064 RES
3004 1K0
I002
2013 220n
I003
3008 2K2
3013 10K
3003 22K
6001 BZX384-C5V6
2011 100n
3039 10K
3038 68K RES
2047 1u0
HVPI-L
2012 220u 35V
3007 47K
2016 2n2
2015 3n9
3006 1K0
2014 3n9
I027
3005 0R
I028
3037 3K9
3010 1K2
I011
2020 220p
3012 10R
2021 220p
2062 47n
I029
3009 220K
2017 100n
7000 TDA8931
POWER COMPARATOR
VDDA
VDDP
IN-
IN+
POWERUP
G
OVP
OUT
BOOT
STABI
DIAG
HVP
HVPI
CGND
VSSA
VSSP
VSSD
I005
I006
I007
6002 BAT54 COL
I025
3046 1K0
I013
2018 15n
I014
I015
I031
2019 2u2 50V
3042 10K
I030
3011 2K2
5006 33u / 2.7A
2022 220n
I017
3014 22R
2023 470n
3040 10K
2024 1m0 25V
I012
2010 100n
2026 220n
HVPI-R
2031 3n9
3023 1K0
2030 3n9
3022 22R
I033
3032 3K9
3026 1K2
I035
2035 220p
3030 10R
2036 220p
2063 47n
I034
3027 220K
2034 100n
7001 TDA8931
I023
2038 15n
5007 33u / 2.7A
3029 2K2
I024
I037
I038
2037 2u2 50V
3043 10K
I036
2045 220n
I021
3031 22R
2042 470n
3041 10K
2043 1m0 25V
I016
2044 100n
2040 220n
6003 BAT54 COL
I026
3047 1K0
2029 220u 35V
3024 47K
2032 2n2
2065 RES
3020 1K0
2033 220n
3025 2K2
I040
3033 10K
4001 RES
I019
3034 3K9
2039 10u
I041
2041 10u
3028 10K
I042
3019 10K
I043
3021 4K7
7004 TL431ACDBV
I022
PHASE INVERTER (UNITY GAIN)
1001
L-
L+
R-
R+
F009
F010
F011
F012
L
R
2052 2n2
2053 2n2
2054 2n2
2055 2n2
*Connection Inverted (R_CH)
RESERVED
2060 2n2
2061 2n2
(Mounting Hole)
1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
G
H

Speaker Impedance	5006 & 5007	2023 & 2042
4 ohm	22uH	680n
6 ohm Selected	33uH	470n
8 ohm	47uH	330n

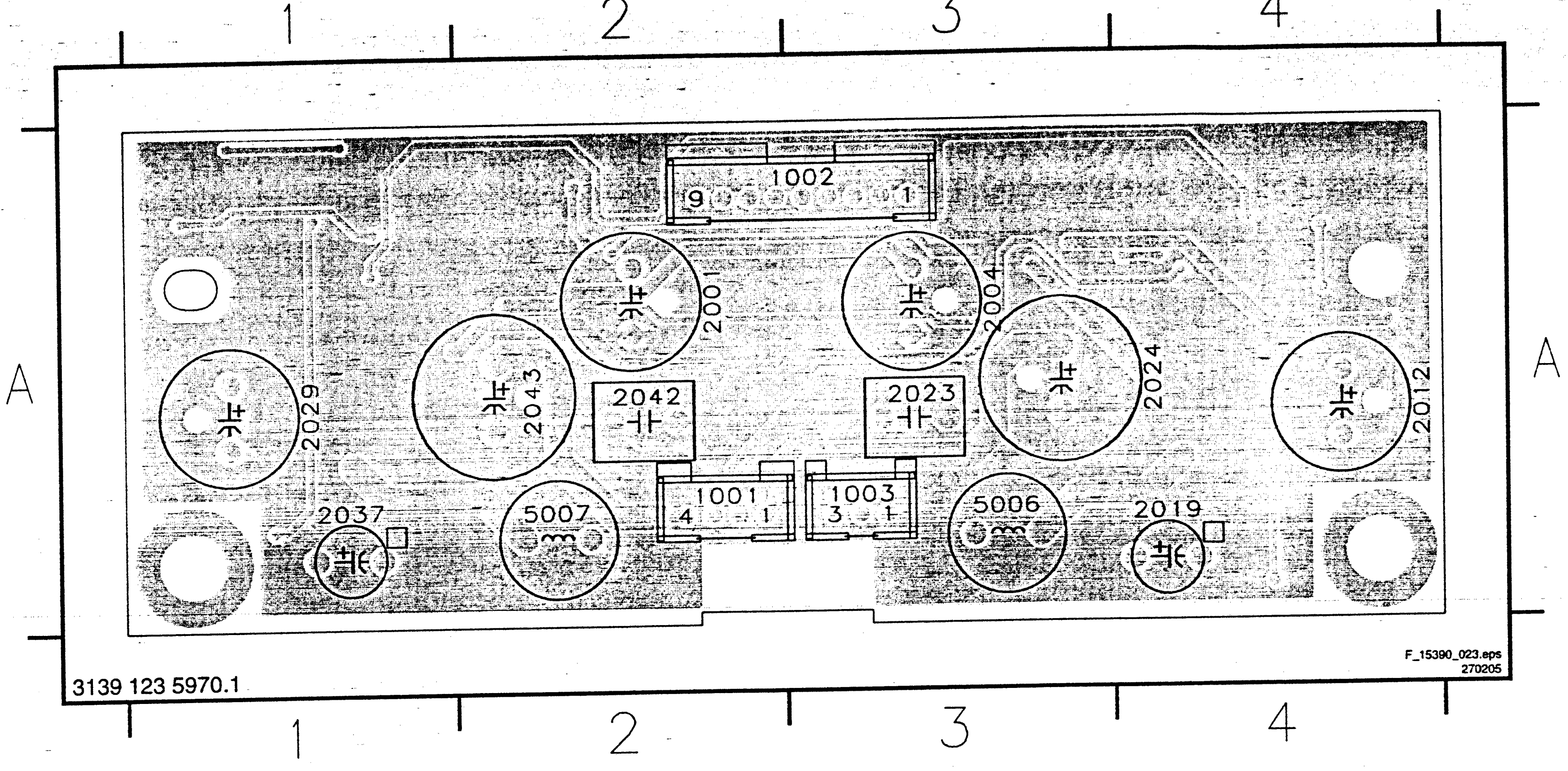
3139 123 5970.1

F_15390_021.eps
270205

1001	E11
1002	C2
1003	A2
2001	B2
2002	B3
2003	B3
2004	B4
2006	C3
2007	C3
2008	C3
2009	C3
2010	C8
2011	C4
2012	A5
2013	B5
2014	A7
2015	A6
2016	A6
2017	B7
2018	C8
2019	C8
2020	A8
2021	B8
2022	C9
2023	C9
2024	C9
2026	C8
2027	D3
2028	D3
2029	F5
2030	D7
2031	E6
2032	F5
2033	F5
2034	E7
2035	E8
2036	E8
2037	F8
2038	F8
2039	F3
2040	G8
2041	F4
2042	F9
2043	F9
2044	G8
2045	F9
2047	C5
2048	B4
2051	C3
2052	E10
2053	E10
2054	E10
2055	E11
2060	F11
2061	F11
2062	B6
2063	E6
2064	B4
2065	F5
3001	A3
3003	C4
3004	B4
3005	B7
3006	A6
3007	B5
3008	B5
3009	B6
3010	B8
3011	C8
3012	B8
3013	C5
3014	C9
3019	F3
3020	F5
3021	G3
3022	E7
3023	E6
3024	F5
3025	F5
3026	E8
3027	E6
3028	F4
3029	F8
3030	E8
3031	F9
3032	E6
3033	F5
3034	F4
3037	B6
3038	C5
3039	C5
3040	C9
3041	F9
3042	C8
3043	F8
3044	D4
3045	D4
3046	D6
3047	G6
4001	E4
4003	D4
5001	A3
5002	C3
5003	C2
5004	B3
5005	D3
5006	C8
5007	F8
6001	C4
6002	C6
6003	G6
7000	C6
7001	F7
7004	F4
7005	D4
F001	A2
F002	B2
F003	C2
F004	C2
F005	C2
F006	C2
F007	A3
F008	A3
F009	E11
F010	E11
F011	E11
F012	E11
I001	B3
I002	B5
I003	B5
I004	C3
I005	C6
I006	C6
I007	C6
I008	D3
I009	D4
I010	D4
I011	B8
I012	C7
I013	C7
I014	C7
I015	C7
I016	F7
I017	C9
I019	E4
I020	F6
I021	F9
I022	G4
I023	F8
I024	F7
I025	D6
I026	G6
IXXX	F3
IXXX	F4
IXXX	F4
IXXX	F5
IXXX	B6
IXXX	B6
IXXX	E6
IXXX	E6
IXXX	A7
IXXX	C7
IXXX	F7
IXXX	F7
IXXX	C8
IXXX	E8
IXXX	F8

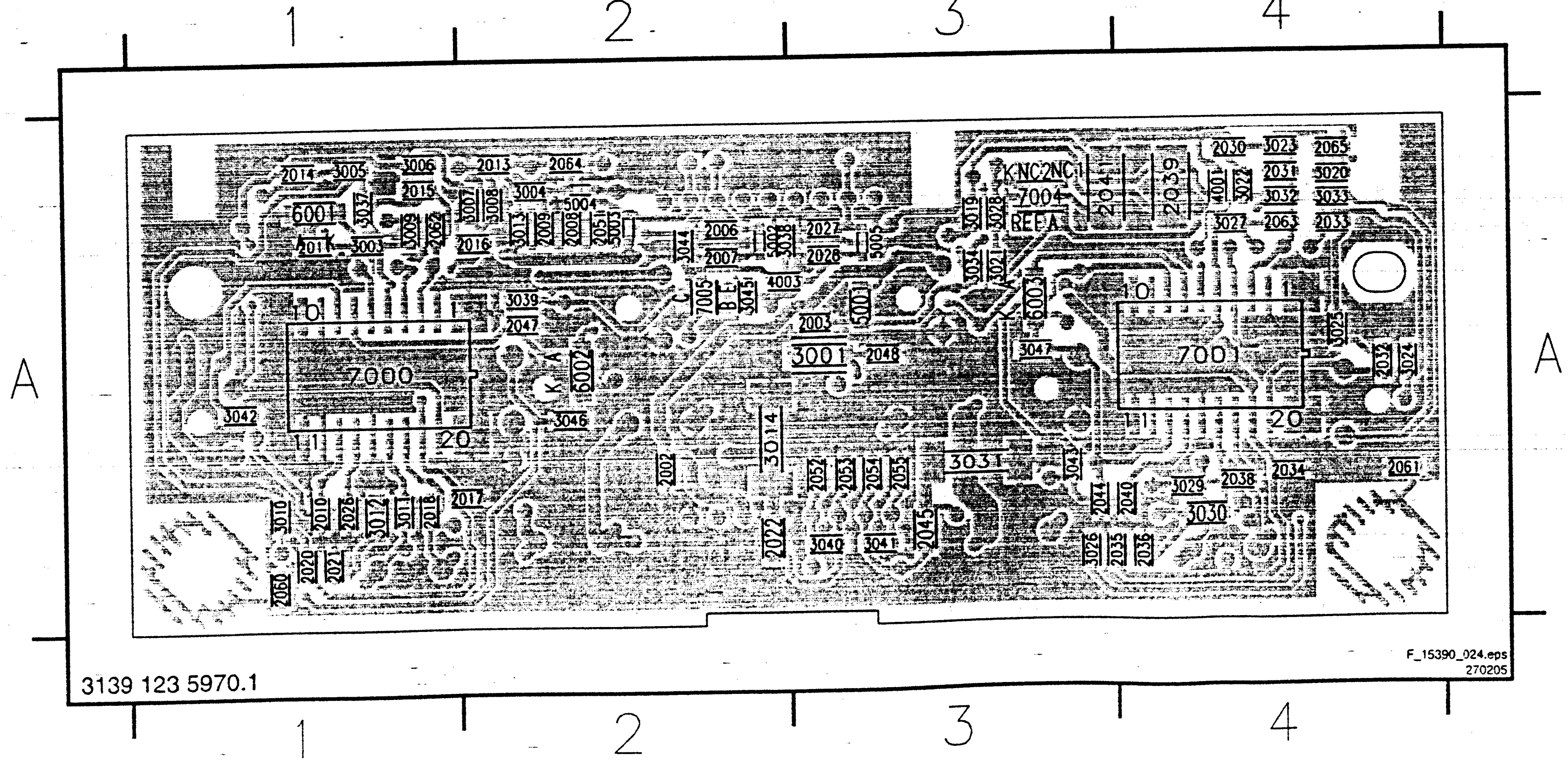
Layout Class D Audio Amplifier (Top Side)

1001	A2
1002	A3
1003	A3
2001	A2
2004	A3
2012	A4
2019	A4
2023	A3
2024	A4
2029	A1
2037	A1
2042	A2
2043	A2
5006	A3
5007	A2

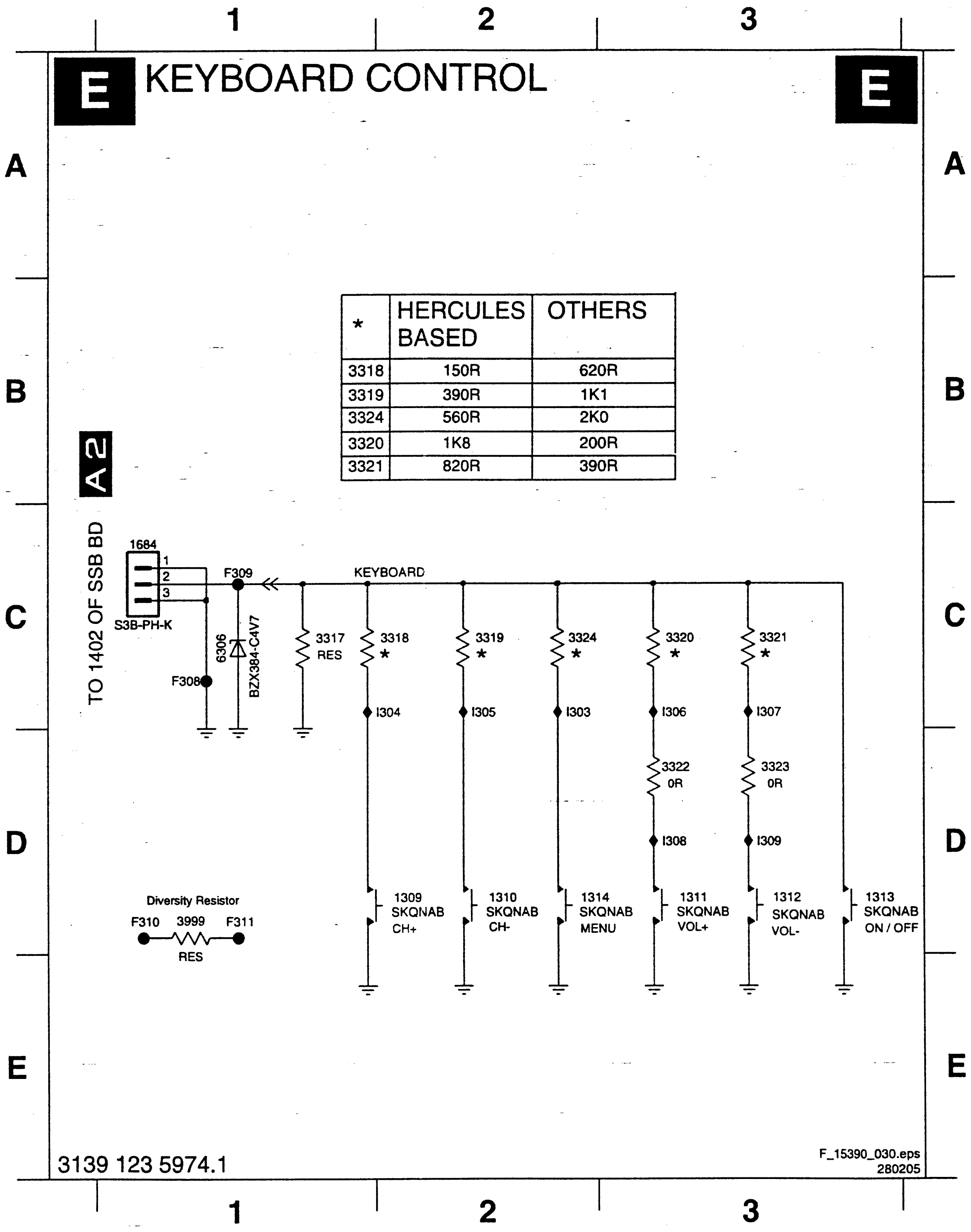

1
2
3
4
A
A
1002
9
1
2001
2004
2029
2043
2042
2023
2024
2012
1001
4
1
1003
3
1
2037
5007
5006
2019
3139 123 5970.1
F_15390_023.eps
270205

Layout Class D Audio Amplifier (Bottom Side)

2002	A2
2003	A3
2006	A2
2007	A2
2008	A2
2009	A2
2010	A1
2011	A1
2013	A2
2014	A1
2015	A1
2016	A2
2017	A2
2018	A1
2020	A1
2021	A1
2022	A2
2026	A1
2027	A3
2028	A3
2030	A4
2031	A4
2032	A4
2033	A4
2034	A4
2035	A3
2036	A4
2038	A4
2039	A4
2040	A4
2041	A3
2044	A3
2045	A3
2047	A2
2048	A3
2051	A2
2052	A3
2053	A3
2054	A3
2055	A3
2060	A1
2061	A4
2062	A1
2063	A4
2064	A2
2065	A4
3001	A3
3003	A1
3004	A2
3005	A1
3006	A1
3007	A2
3008	A2
3009	A1
3010	A1
3011	A1
3012	A1
3013	A2
3014	A2
3019	A3
3020	A4
3021	A3
3022	A4
3023	A4
3024	A4
3025	A4
3026	A3
3027	A4
3028	A3
3029	A4
3030	A4
3031	A3
3032	A4
3033	A4
3034	A3
3037	A1
3038	A2
3039	A2
3040	A3
3041	A3
3042	A1
3043	A3
3044	A2
3045	A2
3046	A2
3047	A3
4001	A4
4003	A2
5001	A3
5002	A2
5003	A2
5004	A2
5005	A3
6001	A1
6002	A2
6003	A3
7000	A1
7001	A4
7004	A3
7005	A2


1
2
3
4
A
A
2014
3005
3006
2013
2064
2015
3004
5004
6001
2011
3003
2016
2006
2007
2027
2028
4003
7005
7004
KNC2NC1
REF A
2041
2039
2030
3023
2065
2031
3020
3032
3033
3022
2063
2033
3039
2047
10
7000
20
6002
3046
3042
2017
2003
3001
2048
3047
700
10
20
3025
3024
3031
3029
3030
2038
2034
2061
3040
3041
2045
2022
2052
2053
2054
3014
2002
2020
2021
2060
3026
2035
2036
3139 123 5970.1
F_15390_024.eps
270205

Keyboard Control Panel


1
2
3
E
KEYBOARD CONTROL
E
A
B
C
D
E
A2
TO 1402 OF SSB BD
1684
1
2
3
S3B-PH-K
F309
KEYBOARD
F308
6306
BZX384-C4V7
3317
RES
3318 *
3319 *
3324 *
3320 *
3321 *
I304
I305
I303
I306
I307
3322
0R
3323
0R
I308
I309
1309 SKQNAB CH+
1310 SKQNAB CH-
1314 SKQNAB MENU
1311 SKQNAB VOL+
1312 SKQNAB VOL-
1313 SKQNAB ON / OFF
Diversity Resistor
F310
3999
F311
RES
3139 123 5974.1
F_15390_030.eps
280205

*	HERCULES BASED	OTHERS
3318	150R	620R
3319	390R	1K1
3324	560R	2K0
3320	1K8	200R
3321	820R	390R

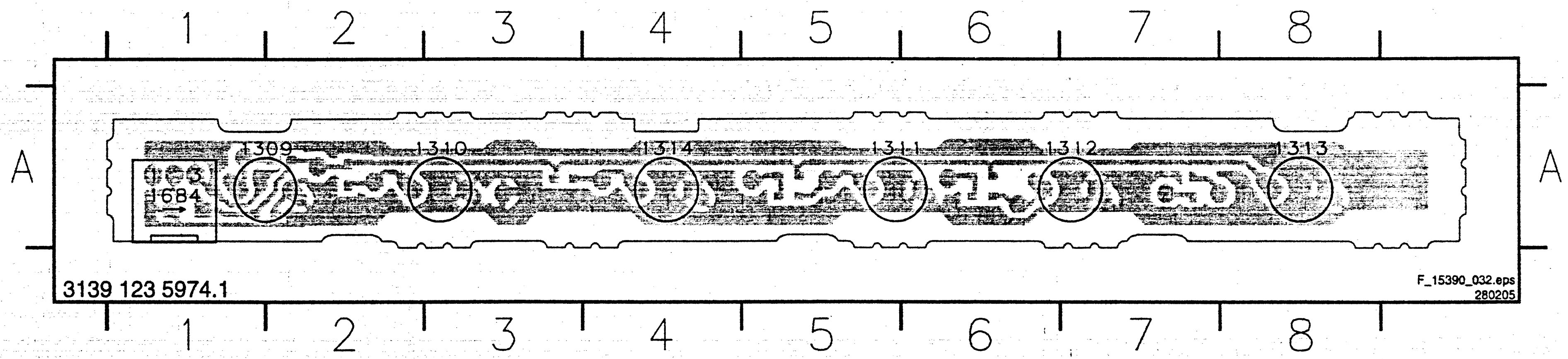
1008	D1
1309	D2
1310	D2
1311	D3
1312	D3
1313	D3
1314	D2
1684	C1
3317	C1
3318	C2
3319	C2
3320	C3
3321	C3
3322	D3
3323	D3
3324	C2
3999	D1
6306	C1
F308	C1
F309	C1
F310	D1
F311	D1
I303	C2
I304	C2
I305	C2
I306	C3
I307	C3
I308	D3
I309	D3

Personal Notes:

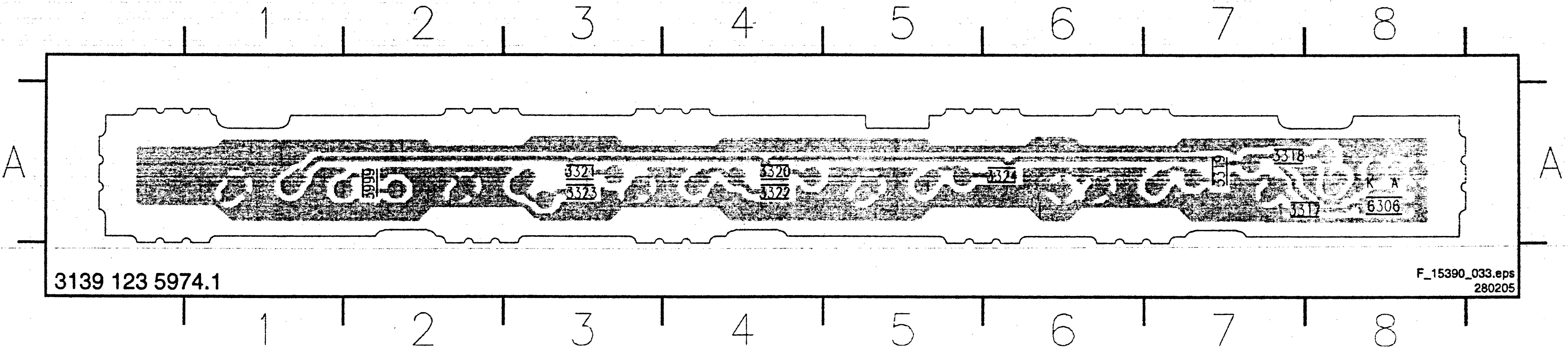
E_06532_012.eps
131004

Layout Keyboard Control Panel (Top Side)

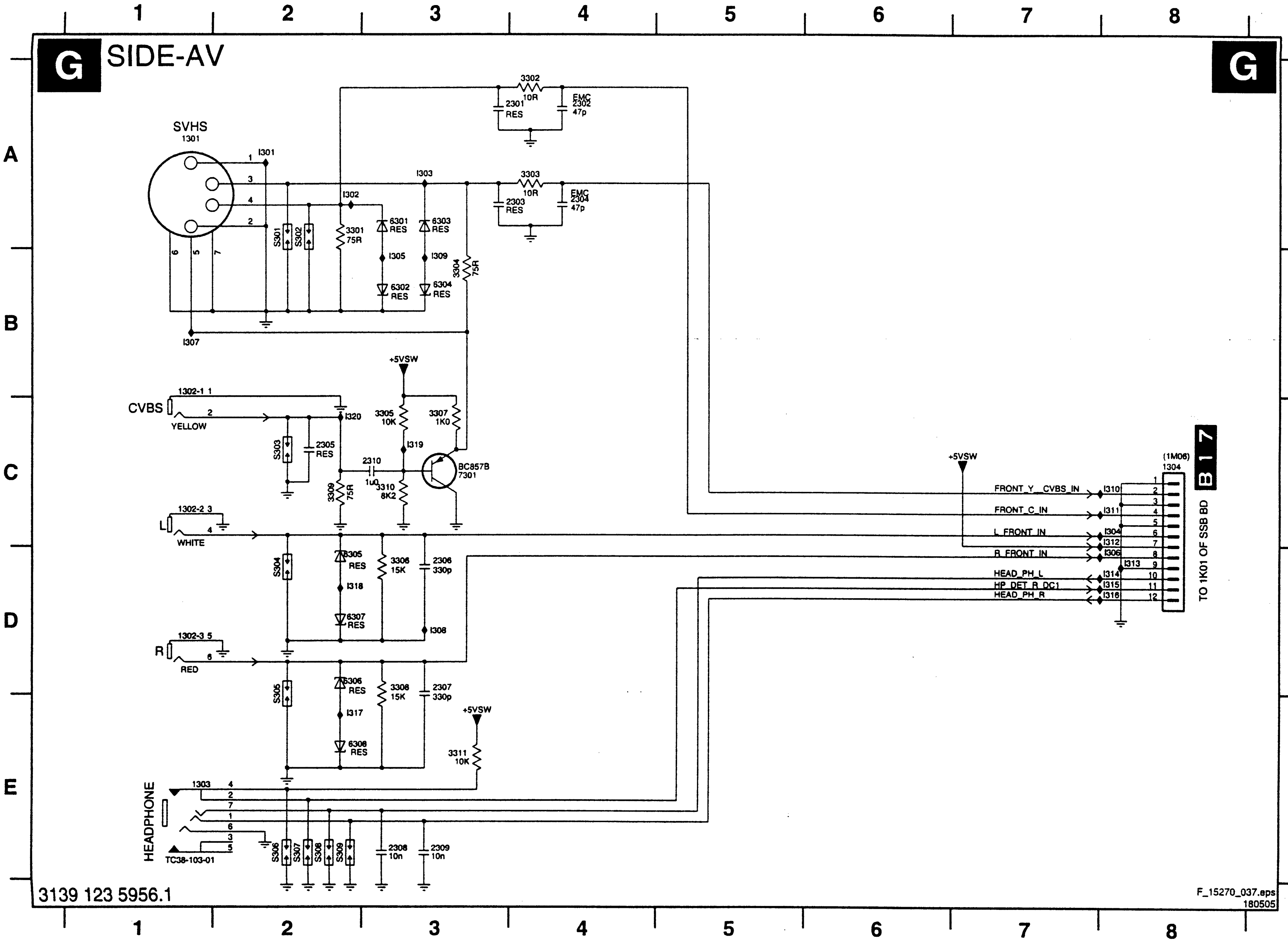
1309 A1	1310 A3	1311 A5	1312 A7	1313 A8	1314 A4	1684 A1


1
2
3
4
5
6
7
8
A
1309
1310
1314
1311
1312
1313
1684
3139 123 5974.1
F_15390_032.eps
280205

Layout Keyboard Control Panel (Bottom Side)

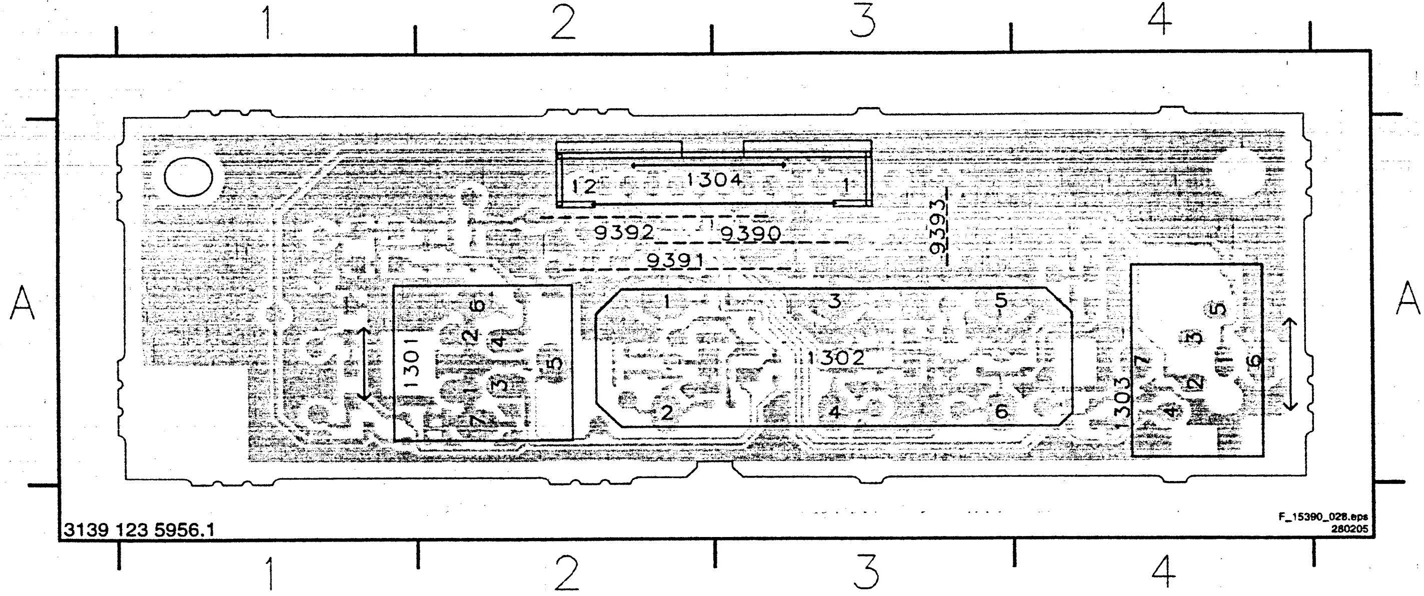

1
2
3
4
5
6
7
8
A
3321
3323
3320
3322
3324
3319
3318
3317
K
A
6306
3139 123 5974.1
F_15390_033.eps
280205

Side A/V Panel


G SIDE-AV
G
SVHS 1301
I301
I302
I303
I307
3302 10R
2301 RES
EMC 2302 47p
3303 10R
2303 RES
EMC 2304 47p
S301
S302
3301 75R
6301 RES
6302 RES
6303 RES
6304 RES
I305
I309
3304 75R
+5VSW
CVBS
1302-1
YELLOW
I320
S303
2305 RES
3305 10K
3307 1K0
I319
2310 1u0
3310 8K2
3309 75R
BC857B 7301
L
1302-2
WHITE
S304
6305 RES
I318
6307 RES
3306 15K
2306 330p
I308
R
1302-3
RED
S305
6306 RES
I317
6308 RES
3308 15K
2307 330p
3311 10K
HEADPHONE
1303
TC38-103-01
S306
S307
S308
S309
2308 10n
2309 10n
FRONT_Y__CVBS_IN
FRONT_C_IN
L_FRONT_IN
R_FRONT_IN
HEAD_PH_L
HP_DET_R_DC1
HEAD_PH_R
I310
I311
I304
I312
I306
I313
I314
I315
I316
(1M06) 1304
B17
TO 1K01 OF SSB BD
3139 123 5956.1
F_15270_037.eps
180505

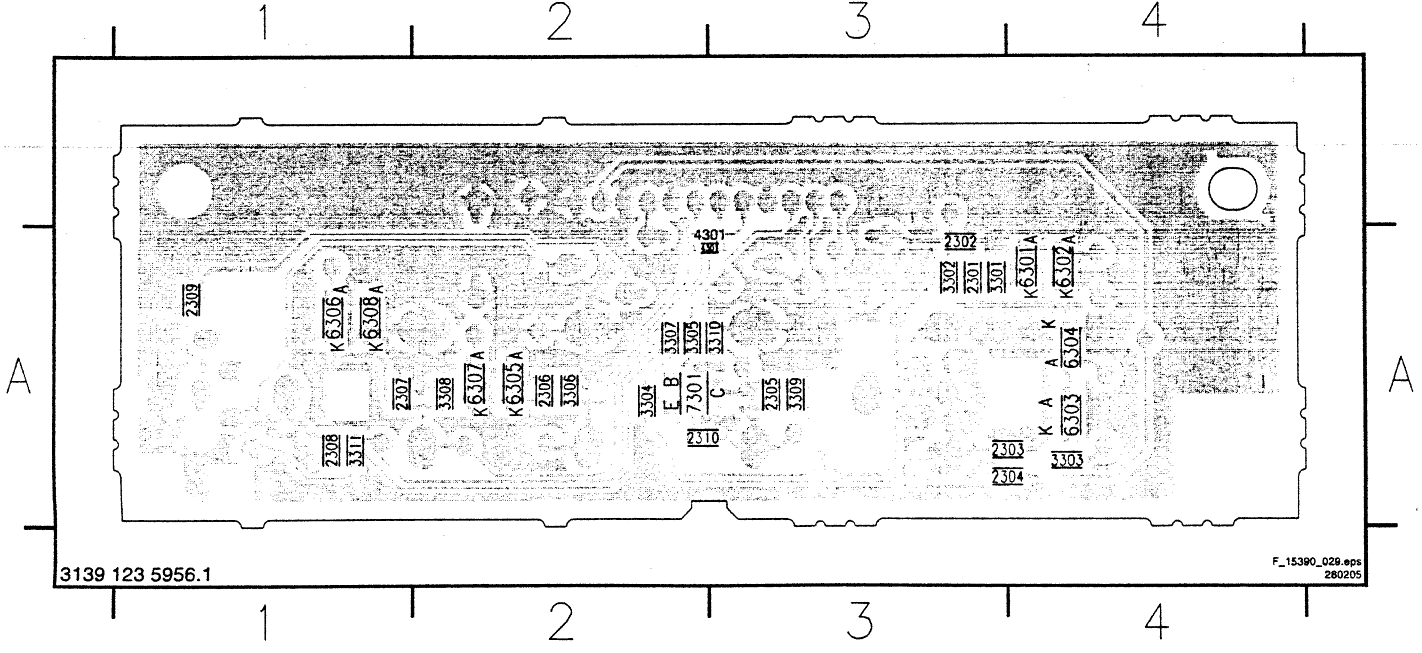
1301	A1
1302-1	B1
1302-2	C1
1302-3	D1
1303	E1
1304	C8
2301	A4
2302	A4
2303	A4
2304	A4
2305	C2
2306	D3
2307	D3
2308	E3
2309	E3
2310	C3
3301	A2
3302	A4
3303	A4
3304	B3
3305	C3
3306	D3
3307	C3
3308	D3
3309	C2
3310	C3
3311	E3
6301	A3
6302	B3
6303	A3
6304	B3
6305	D2
6306	D2
6307	D2
6308	E2
7301	C3
I301	A2
I302	A2
I303	A3
I304	C8
I305	B3
I306	D8
I307	B1
I308	D3
I309	B3
I310	C8
I311	C8
I312	C8
I313	D8
I314	D8
I315	D8
I316	D8
I317	E2
I318	D2
I319	C3
I320	C2
S301	A2
S302	A2
S303	C2
S304	D2
S305	D2
S306	E2
S307	E2
S308	E2
S309	E2

Layout Side A/V Panel (Top Side)


1
2
3
4
A
1304
12
1
9392
9390
9391
9393
1301
1302
1303
3139 123 5956.1
F_15390_028.eps
280205

1301	A1
1302	A3
1303	A4
1304	A2
9390	A3
9391	A2
9392	A2
9393	A3

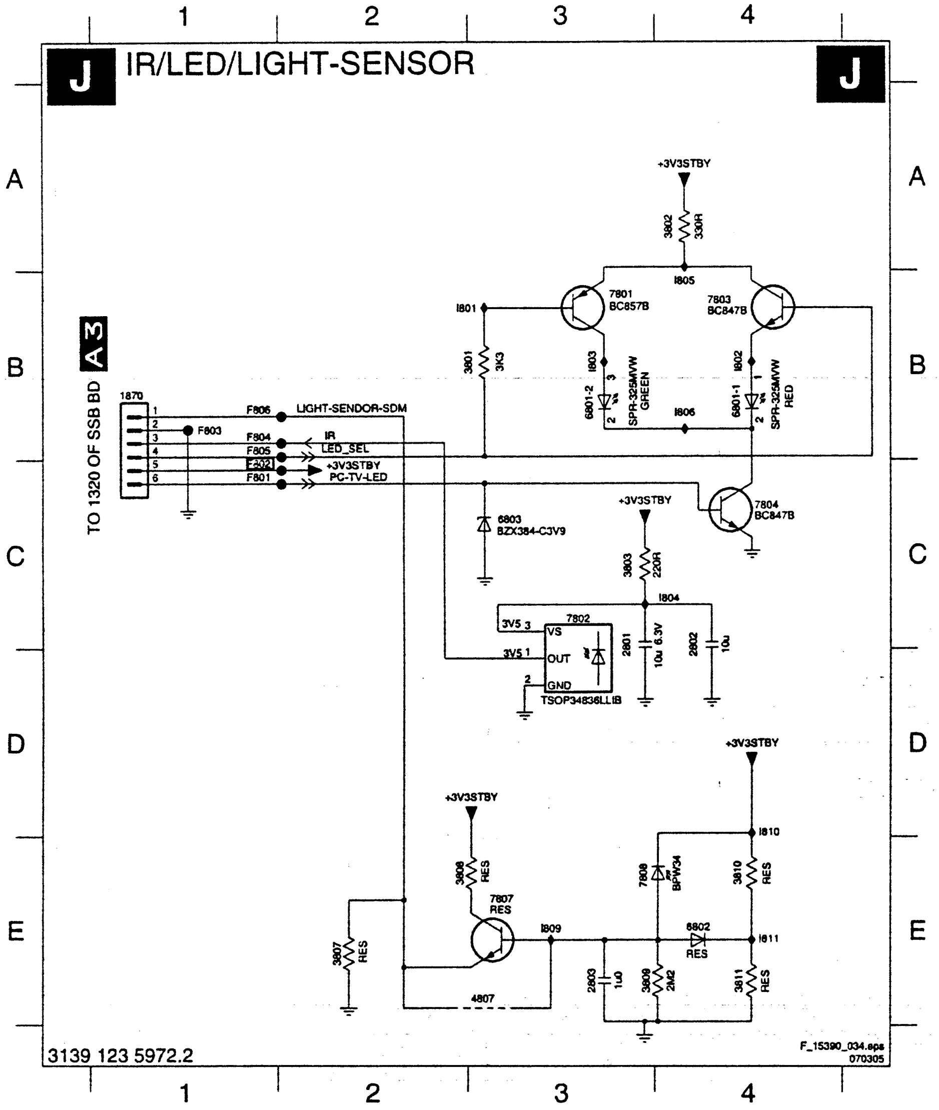
Layout Side A/V Panel (Bottom Side)


1
2
3
4
A
4301
2302
3302
2301
3301
6301
6302
2309
6306
6308
3307
3305
3310
6304
2307
3308
6307
6305
2306
3306
3304
7301
E
B
C
2305
3309
6303
2310
2308
3311
2303
2304
3303
K
A
3139 123 5956.1
F_15390_029.eps
280205

2301	A3
2302	A3
2303	A3
2304	A3
2305	A3
2306	A2
2307	A1
2308	A1
2309	A1
2310	A2
3301	A3
3302	A3
3303	A4
3304	A2
3305	A2
3306	A2
3307	A2
3308	A2
3309	A3
3310	A3
3311	A1
4301	A3
6301	A4
6302	A4
6303	A4
6304	A4
6305	A2
6306	A1
6307	A2
6308	A1
7301	A2

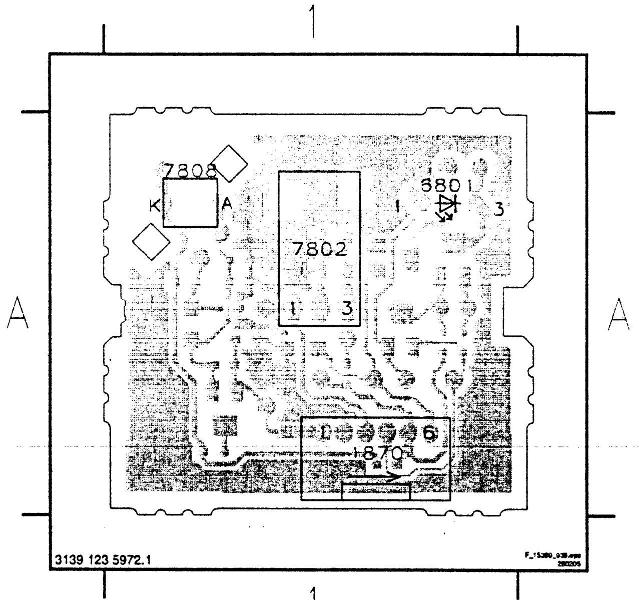
IR-LED and Light Sensor Panel

1870 B1
2801 C3
2802 C4
2803 E3
3801 B2
3802 A4
3803 C3
3807 E2
3808 E2
3809 E3
3810 E4
3811 E4
4807 E3
6801-1 B4
6801-2 B3
6802 E4
6803 C3
7801 B3
7802 C3
7803 B4
7804 C4
7807 E3
7808 E3
F801 C1
F802 C1
F803 B1
F804 B1
F805 B1
F806 B1
I801 B2
I802 B4
I803 B3
I804 C4
I805 B4
I806 B4
I809 E3
I810 D4
I811 E4


1
2
3
4
A
B
C
D
E
J
IR/LED/LIGHT-SENSOR
J
A3
TO 1320 OF SSB BD
1870
1
2
3
4
5
6
F806
LIGHT-SENDOR-SDM
F803
F804
IR
F805
LED_SEL
F802
+3V3STBY
F801
PC-TV-LED
+3V3STBY
3802
330R
I805
I801
7801
BC857B
7803
BC847B
3801
3K3
I803
I802
6801-2
SPR-325MVW
GREEN
3
2
I806
6801-1
SPR-325MVW
RED
1
2
6803
BZX384-C3V9
7804
BC847B
+3V3STBY
3803
220R
I804
7802
3V5 3
VS
3V5 1
OUT
2
GND
TSOP34836LLIB
2801
10u 6.3V
2802
10u
+3V3STBY
+3V3STBY
I810
3808
RES
7807
RES
7808
BPW34
3810
RES
3807
RES
I809
6802
RES
I811
2803
1u0
3809
2M2
3811
RES
4807
3139 123 5972.2
F_15390_034.eps
070305

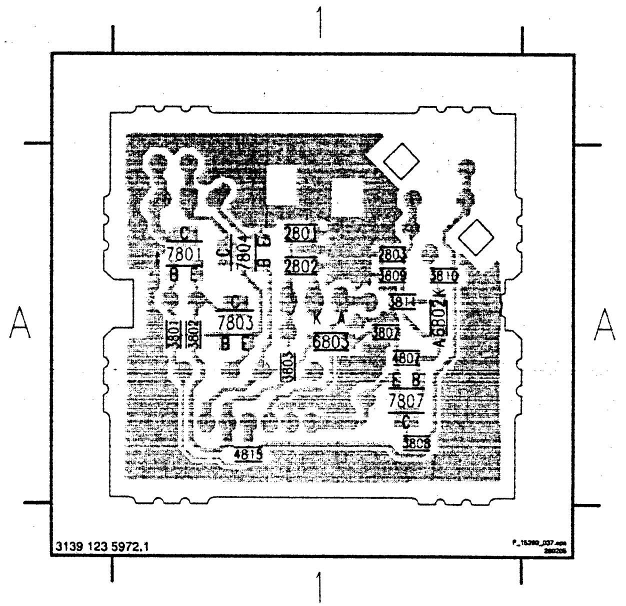
Layout IR-LED and Light Sensor Panel (Top Side)

1870 A1
6801 A1
7802 A1
7808 A1


1
A
A
7808
K
A
7802
1
3
6801
1
3
1870
6
3139 123 5972.1
1

Layout IR-LED and Light Sensor Panel (Bottom Side)

2801 A1
2802 A1
2803 A1
3801 A1
3802 A1
3803 A1
3807 A1
3808 A1
3809 A1
3810 A1
3811 A1
4807 A1
4815 A1
6802 A1
6803 A1
7801 A1
7803 A1
7804 A1
7807 A1


1
A
A
C
7801
B E
C
7804
B E
2801
2802
2803
3809
3810
3811
K
6802
A
C
7803
B E
3801
3802
3803
K A
6803
3807
4807
E B
7807
C
3808
4815
3139 123 5972.1
1

Personal Notes:

E_06532_013.eps
131004

8. Alignments

Index of this chapter:

8.1 General Alignment Conditions
8.2 Hardware Alignments
8.3 Software Alignments

Note: Figures below can deviate slightly from the actual situation, due to the different set executions.

General: The Service Default Mode (SDM) and Service Alignment Mode (SAM) are described in chapter 5. Menu navigation is done with the Cursor Up, Down, Left or Right keys of the remote control transmitter.

8.1 General Alignment Conditions

Perform all electrical adjustments under the following conditions:
Mains voltage and frequency: 100-240 V / 50/60 Hz.
Allow the set to warm up for approximately 10 minutes.
Test probe: Ri > 10 MΩ; Ci < 2.5 pF.

8.2 Hardware Alignments

There are no hardware alignments foreseen for the LCD-TV.

8.3 Software Alignments

With the software alignments of the Service Alignment Mode (SAM) the geometry, white tone and tuner (IF) can be aligned.
To store the data: Use the RC button Menu to switch to the main menu and next, switch to 'Stand-by' mode.

8.3.1 SAM Menu

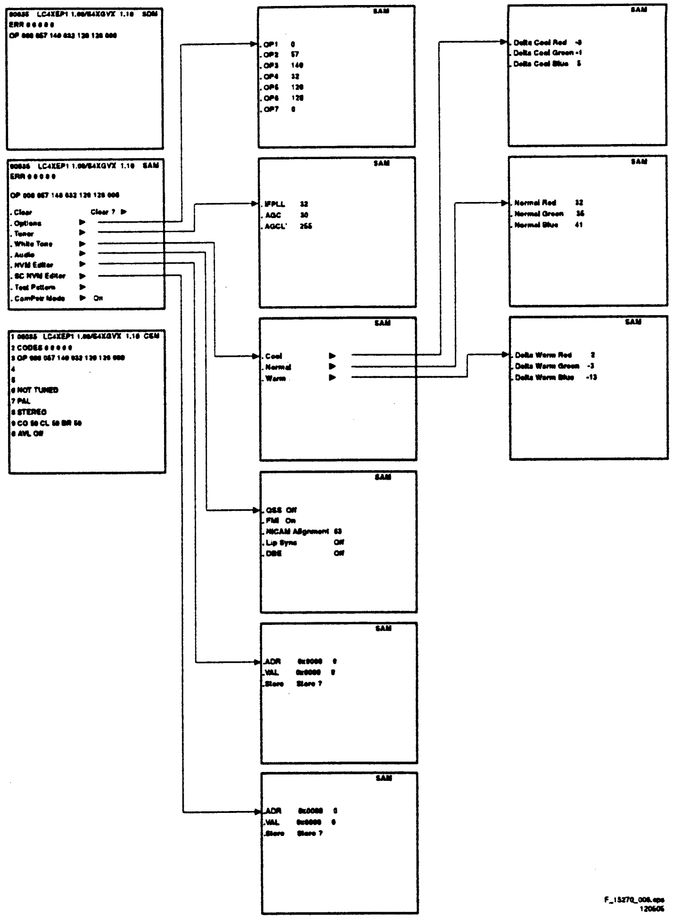

00035 LC4XEP1 1.00/S4XGVX 1.10 SDM
ERR 0 0 0 0 0
OP 000 057 140 032 120 120 000
00035 LC4XEP1 1.00/S4XGVX 1.10 SAM
ERR 0 0 0 0 0
OP 000 057 140 032 120 120 000
. Clear Clear ? ▶
. Options ▶
. Tuner ▶
. White Tone ▶
. Audio ▶
. NVM Editor ▶
. SC NVM Editor ▶
. Test Pattern ▶
. ComPair Mode ▶ On
1 00035 LC4XEP1 1.00/S4XGVX 1.10 CSM
2 CODES 0 0 0 0 0
3 OP 000 057 140 032 120 120 000
4
5
6 NOT TUNED
7 PAL
8 STEREO
9 CO 50 CL 50 BR 50
0 AVL Off
SAM
. OP1 0
. OP2 57
. OP3 140
. OP4 32
. OP5 120
. OP6 120
. OP7 0
SAM
. IFPLL 32
. AGC 30
. AGCL' 255
SAM
. Cool ▶
. Normal ▶
. Warm ▶
SAM
. OSS Off
. FMI On
. NICAM Alignment 63
. Lip Sync Off
. DBE Off
SAM
. ADR 0x0000 0
. VAL 0x0000 0
. Store Store ?
SAM
. ADR 0x0000 0
. VAL 0x0000 0
. Store Store ?
SAM
. Delta Cool Red -8
. Delta Cool Green -1
. Delta Cool Blue 5
SAM
. Normal Red 32
. Normal Green 35
. Normal Blue 41
SAM
. Delta Warm Red 2
. Delta Warm Green -3
. Delta Warm Blue -13
F_15270_006.eps
120606

Figure 8-1 Overview SAM menu.

8.3.2 Tuner Adjustment

AGC (RF AGC Take Over Point)

- Activate the SAM menu.
- Go to the sub-menu Tuner.
- Select the AGC sub-menu.
- Adjust the AGC value to AGC = 27.
- Adjust the AGC L' value to AGC L' = 27 (Europe only).
- Adjust the IFPLL value to IFPLL = 32 (Europe only).
- Switch the set to standby to store the data.

8.3.3 DCXO (Digital Xtal Oscillator) Alignment (for NICAM sets only)

- Input a Colour bar signal with a colour subcarier frequency of 4.43 MHz on SCART1 or SCART2.
- Select as a signal source EXT1 or AV1.
- Go to the SAM menu and select Audio.
- Activate DCXO Alignment and wait until this process has finished (DONE).
- Check if the NICAM audio reception is OK, if not: repeat the procedure.
- Switch the set to standby to store the data.

8.3.4 ADC Gain, Grey Scale Alignment & Panel Size Settings

The table below shows a number of NVM settings used for each model of TV set. Be sure to use the correct editor in the SAM menu (NVM Editor or SC NVM Editor), because the first one is used for the Hercules NVM, and the second one for the SCALER (SC) part of the TV set. For further important NVM settings, see also the other NVM tables elsewhere in this manual.

Caution:

- **Do not change the NVM settings without understanding the function of each setting, because incorrect NVM settings may seriously hamper the correct functioning of the TV set!**
- **Do not change the Scaler NVM settings, as this will hamper the DVI functionality of the TV set!**
- Always note down the existing NVM settings, before changing the settings. This will enable you to return to the orgininal settings, if the new settings turn out to be incorrect.

Table 8-1 ADC gain, grey scale alignment & panel size settings

SDTV ADC Gain settings: Use the NVM Editor in SAM to set these values in the Hercules NVM								
		These models are with ADC & Columbus 3D Combfilter					**Without ADC & 3D Combfilter**	
Setting	**Hercules NVM Address (decimal value)**	**32PF7320/10**	**32PF5320/10**	**26PF5320/10**	**Settings Range (decimal value)**		**26PF4310/10**	**Settings Range (decimal value)**
NVM_ADC_GAIN_R	006	110	110	110	075 - 155		N.A.	N.A.
NVM_ADC_GAIN_G	007	180	180	180	150 - 200		N.A.	N.A.
NVM_ADC_GAIN_B	008	110	110	110	075 - 155		N.A.	N.A.
SDTV Greyscale settings: Use the SC NVM Editor in SAM to set these values in the Scaler NVM								
		These models are with ADC & Columbus 3D Combfilter					**Without ADC & 3D Combfilter**	
Setting	**Scaler NVM Address (decimal value)**	**32PF7320/10**	**32PF5320/10**	**26PF5320/10**	**Settings Range (decimal value)**		**26PF4310/10**	**Settings Range (decimal value)**
ADC_RED_OFFSET2	338	080	080	080	050 - 110		080	050 - 110
ADC_GRN_OFFSET2	339	080	080	080	050 - 110		080	050 - 110
ADC_BLU_OFFSET2	340	080	080	080	050 - 110		080	050 - 110
ADC_RED_GAIN	341	065	065	065	040 - 095		170	135 - 190
ADC_GRN_GAIN	343	065	065	065	040 - 095		135	135 - 190
ADC_BLU_GAIN	345	065	065	065	040 - 095		170	135 - 190
PC Greyscale settings								
		These models are with ADC & Columbus 3D Combfilter					**Without ADC & 3D Combfilter**	
Setting	**Scaler NVM Address (decimal value)**	**32PF7320/10**	**32PF5320/10**	**26PF5320/10**	**Settings Range (decimal value)**		**26PF4310/10**	**Settings Range (decimal value)**
ADC_RED_OFFSET2	325	080	080	080	040 - 090		080	040 - 090
ADC_GRN_OFFSET2	326	080	080	080	040 - 090		080	040 - 090
ADC_BLU_OFFSET2	327	080	080	080	040 - 090		080	040 - 090
ADC_RED_GAIN	328	200	200	200	180 - 270		154	180 - 270
ADC_GRN_GAIN	330	200	200	200	180 - 270		154	180 - 270
ADC_BLU_GAIN	332	200	200	200	180 - 270		154	180 - 270
HD Greyscale settings								
		These models are with ADC & Columbus 3D Combfilter					**without ADC & 3D Combfilter**	
Setting	**Scaler NVM Address (decimal value)**	**32PF7320/10**	**32PF5320/10**	**26PF5320/10**	**Settings Range (decimal value)**		**26PF4310/10**	**Settings Range (decimal value)**
ADC_RED_OFFSET2	351	064	064	064	050 - 090		064	050 - 090
ADC_GRN_OFFSET2	352	082	082	082	050 - 090		082	050 - 090
ADC_BLU_OFFSET2	353	064	064	064	050 - 090		064	050 - 090
ADC_RED_GAIN	354	159	159	159	120 - 200		159	120 - 200
ADC_GRN_GAIN	356	144	144	144	120 - 200		144	120 - 200
ADC_BLU_GAIN	358	147	147	147	120 - 200		147	120 - 200
Panel size settings								
		WXGA 16x9 panel, brand: LPL					**WXGA 15x9 panel**	
Setting	**Scaler NVM Address (decimal value)**	**32PF7320/10**	**32PF5320/10**	**26PF5320/10**			**26PF4310/10, brand: QDI**	**26PF4310/10, brand: LPL**
NVM_PANEL_SEL	320	015	015	026			025	027

8.3.5 Sound

- For NICAM sets: see paragraph 8.3.3.
- For other sets: No adjustments needed for sound.

8.3.6 Options

Options OP1...OP7 in the SAM menu can be used for quickly restoring 64 features or settings of the SCALER part of the TV set to their orginal default factory values (8 groups of 8 features/settings each). When the decimal value of one option byte OP1...OP7 is changed (see the first table below) then a group of 8 bits, representing 8 SCALER options or features, is changed as well (see the second table below for a detailed description of the features or settings that are changed).
The second table shows which option byte (OP1...OP7) represents which group of 8 option bits. Each bit (0...7) switches a particular SCALER feature or setting ON or OFF, depending on its value (1 or 0).
It is also possible to change the features or settings mentioned in the second table directly at bit level, by means of the SC (i.e., SCALER) NVM Editor in the SAM menu. In the SC NVM Editor, first the correct NVM address (ADR) has to be entered, then the correct value (VAL, 1 or 0) for each bit (see second table), and finally the settings have to be stored (STORE). For quickly restoring the SCALER part of the TV set to its original factory settings, however, it is more convenient to simply enter the default factory settings OP1...OP7 that are given in the first table below. How to do this, is described in the next paragraph.

How to Change an Option Byte
As has been explained above, an Option byte (OP) represents a number of different SCALER options. Changing these bytes directly makes it possible to set all SCALER options very fast. All options are controlled via seven option bytes. Select the option byte (OP1.. OP7) with the Menu Up/ Down keys, and enter the new (decimal) value. For the correct Factory Default settings, see the first table below. For more detailed information, see the second table.

Leaving the Option submenu saves the changes in the Option Byte settings. Some changes will only take effect after the set has been switched "off" and "on" with the AC power switch (cold start).

Table 8-2 Option codes OP1...OP7

Option table for quickly restoring the SCALER to its Factory Default settings				
Model number	**32PF7320/10**	**32PF5320/10**	**26PF5320/10**	**26PF4310/10**
OP1	152	152	152	152
OP2	37	37	37	37
OP3	79	15	15	14
OP4	113	113	113	113
OP5	252	252	252	252
OP6	27	27	27	27
OP7	19	19	19	3
Options (can be changed only via the SAM menu)	**Total decimal value for each option per model number**			

How to Change Options at Bit Level
If you wish to know which features or settings of the SCALER are changed via OP1...OP7, or if you want to change each option or feature bit by bit, use the more detailed table below.
Note: the table below contains only part of the NVM settings that can be changed (i.e., only part of the SCALER settings). A second range of settings and features, belonging to the HERCULES part of the TV set, can be found in Chapter 5 of this manual, in Table 5-2. The HERCULES NVM settings mentioned there can only be changed via the NVM editor, and not via the SCALER "Options" OP1...OP7. For further settings, see also the NVM settings in the Table "ADC Gain, Grey scale alignment & panel size settings" elsewhere in this manual.

Table 8-3 Option codes in detail, at bit level

Option byte & bit table for restoring the SCALER to its original Factory Default settings via the SC NVM Editor in the SAM menu					
	Model number	32PF7320/10	32PF5320/10	26PF5320/10	26PF4310/10
OP1	**Description of feature/option to be switched ON or OFF**				
bit 7 (msb)	OP_PHILIPS_TUNER	1	1	1	1
bit 6	OP_FM_RADIO	0	0	0	0
bit 5	OP_LNA	0	0	0	0
bit 4	OP_ATS // for EU	1	1	1	1
bit 3	OP_ACI	1	1	1	1
bit 2	OP_UK_PNP	0	0	0	0
bit 1	OP_VIRGIN_MODE	0	0	0	0
bit 0 (lsb)	OP_CHINA	0	0	0	0
	Total DEC Value	152	152	152	152
	Total HEX Value	98	98	98	98
OP2					
bit 7 (msb)	OP_SC	0	0	0	0
bit 6	OP_IBEX	0	0	0	0
bit 5	OP_CHANNEL_NAMING	1	1	1	1
bit 4	OP_LTI (Lum Transcient Improvmt)	0	0	0	0
bit 3	OP_TILT	0	0	0	0
bit 2	OP_FINE_TUNING	1	1	1	1
bit 1	OP_PIP_PHILIPS_TUNER	0	0	0	0
bit 0 (lsb)	OP_HUE	1	1	1	1
	Total DEC Value	37	37	37	37
	Total HEX Value	25	25	25	25
OP3					
bit 7 (msb)	OP_EW_FUNCTION	0	0	0	0
bit 6	OP_PIXEL_PLUS	1	0	0	0
bit 5	OP_PIP_SPLITTER // temp	0	0	0	0
bit 4	OP_SPLITTER // temp	0	0	0	0
bit 3	OP_VIRTUAL_DOLBY	1	1	1	1
bit 2	OP_WIDE_SCREEN	1	1	1	1
bit 1	OP_WSSB	1	1	1	1
bit 0 (lsb)	OP_OP_ME5 // OP_ME5 - 5/6 local buttons implementation	1	1	1	0
	Total DEC Value	79	15	15	14
	Total HEX Value	4F	0F	0F	0E
OP4					
bit 7 (msb)	OP_LIP_SYNC	0	0	0	0
bit 6	OP_HD	1	1	1	1
bit 5	OP_ULTRA_BASS	1	1	1	1
bit 4	OP_DELTA_VOLUME	1	1	1	1
bit 3	OP_TAIWAN_KOREA	0	0	0	0
bit 2	OP_VOLUME_LIMITER	0	0	0	0
bit 1	OP_STEREO_DBX	0	0	0	0
bit 0 (lsb)	OP_STEREO_NICAM_2CS	1	1	1	1
	Total DEC Value	113	113	113	113
	Total HEX Value	71	71	71	71
OP5					
bit 7 (msb)	OP_AV1	1	1	1	1
bit 6	OP_AV2	1	1	1	1
bit 5	OP_AV3	1	1	1	1
bit 4	OP_CVI	1	1	1	1
bit 3	OP_SVHS2	1	1	1	1
bit 2	OP_SVHS3	1	1	1	1
bit 1	OP_HOTEL_MODE	0	0	0	0
bit 0 (lsb)	OP_SIMPLY_FACTORY=OP_BTSC_AVSTEREO	0	0	0	0
	Total DEC Value	252	252	252	252
	Total HEX Value	FC	FC	FC	FC
OP6					
bit 7 (msb)	OP_PERSONAL_ZAPPING	0	0	0	0
bit 6	OP_SMART_SURF	0	0	0	0
bit 5	OP_FMTRAP	0	0	0	0
bit 4	OP_COMBFILTER	1	1	1	1
bit 3	OP_ACTIVE_CONTROL	1	1	1	1
bit 2	OP_VIDEO_TEXT	0	0	0	0
bit 1	OP_LIGHT_SENSOR	1	1	1	1
bit 0 (lsb)	OP_TWIN_TEXT	1	1	1	1
	Total DEC Value	27	27	27	27
	Total HEX Value	1B	1B	1B	1B
OP7					
bit 7 (msb)	OP_TIME_WIN1	0	0	0	0
bit 6	OP_DVB_USB = OP_MALAY	0	0	0	0
bit 5	OP_AMBILIGHT	0	0	0	0
bit 4	OP_COLUMBUS	1	1	1	0
bit 3	OP_DUMMY6	0	0	0	0
bit 2	OP_DUMMY7	0	0	0	0
bit 1	OP_WEST_EU	1	1	1	1
bit 0 (lsb)	OP_MULTI_STANDARD_EUR	1	1	1	1
	Total DEC Value	19	19	19	3
	Total HEX Value	03	03	03	03

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9. Circuit Descriptions, Abbreviation List, and IC Data Sheets

Index of this chapter:

9.1 Introduction
9.2 Block Diagram
9.3 Input/Output
9.4 Tuner and IF
9.5 Video: TV Part (Diagrams B1, B2, and B3)
9.6 Columbus
9.7 Video: Scaler Part (Diagram B7, B8 and B9)
9.8 Audio Processing
9.9 Control
9.10 Abbreviation List
9.11 IC Data Sheets

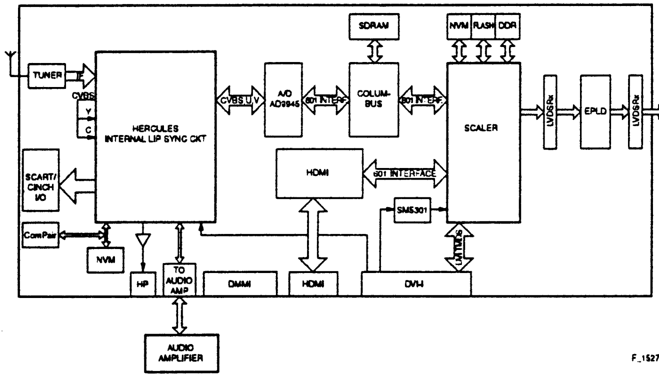
9.1 Introduction

The LC4.3 LCD TV is a global LCD TV for the year 2005. It is the successor of the LC4.2 LCD TV and covers screens sizes 26 inch (in 15:9 and 16:9 ratio) and 32 inch (in 16:9 ratio) and has a new styling, called ME5. There are three different picture qualities available, depending on the model: Pixel Plus, Digital Cristal Clear and Cristal Clear. The block diagram below (Figure 2.1) shows the Pixel Plus architecture; the architectures of the other models are shown in the block diagram on the next page (Figure 2.2).

The architecture consists of a TV and Scaler panel, I/O panel, Side I/O and Local Keyboard panel and Power Supply panel. The functions for video/audio processing, microprocessor (P), and CC/Teletext (TXT) decoder are all combined in one IC (TDA150xx, item 7217), the so-called third generation Ultimate One Chip (UOC-III) or "Hercules". This chip has the following features:

- Control, small signal, mono/stereo, and extensive Audio/Video switching in one IC.
- Upgrade with digital sound & video processing.
- Alignment free IF, including SECAM-L/L1 and AM.
- FM sound 4.5/5.5/6.0/6.5, no traps/bandpass filters.
- Full multi-standard colour decoder.
- One Xtal reference for all functions (microprocessor, RCP, TXT/CC, RDS, colour decoder, and stereo sound processor).

9.2 Block Diagram



F_15270_007.eps
2005CS

Figure 9-1 Block Diagram

The PLL tuner UV1318 delivers the IF-signal, via audio & video SAW-filters, to the Video Signal Processor and FLASH embedded TEXT/Control/Graphics Micro Controller TDA120x1 (item 7011, also called Hercules). This IC has the following functions:

- Analogue Video Processing
- Sound Demodulation
- Audio Interfaces and switching
- Volume and tone control for loudspeakers
- Reflection and delay for loudspeaker channels
- Micro Controller
- Data Capture
- Display

The Hercules has one input for the internal CVBS signal and a video switch with 3 external CVBS inputs and a CVBS output. All CVBS inputs can be used as Y-input for Y/C signals. However, only 2 Y/C sources can be selected because the circuit has 2 chroma inputs. It is possible to add an additional CVBS(Y)/C input (CVBS/YX and CX) when the YUV interface and the RGB/YPRPB input are not needed. Two SCART-connectors are used: SCART1 is for RGB-in, video in (CVBS) and terrestrial out (CVBS), and SCART2 is meant for VCR (CVBS out and Y/C in). The CVBS-out on pin 19 of SCART2 can be used for monitoring purposes: WYSIWYR (What You See Is What You Record).
Depending on the model of the TV set, the Hercules delivers its RGB signals either directly to the Scaler IC or indirectly, via a Columbus chip (for 2D/3D comb filtering and spatial/temporal noise reduction, for its description: see further down in this text). The EPLD, which is present in Pixel Plus models, provides additional sharpening to the picture. For a general outline, see the table and the block diagrams below, in which the architectures of the various models are given, together with their electronic building blocks.

Table 9-1 Models and picture quality

Model	Picture quality
32PF7320/10	Pixel Plus
32PF5320/10	Digital Crystal Clear
26PF5320/10	Digital Crystal Clear
26PF4310/10	Crystal Clear

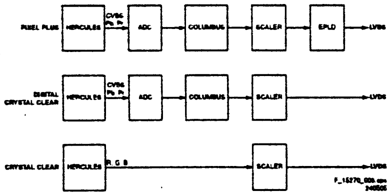

PIXEL PLUS
HERCULES
CVBS
Pb Pr
ADC
COLUMBUS
SCALER
EPLD
LVDS
DIGITAL
CRYSTAL CLEAR
CRYSTAL CLEAR
R. G. B
F_15270_008.eps
240505

Figure 9-2 Block diagram of the internal building blocks

The Genesis GM1501 Malibu Scaler IC can receive two video input signals: SDTV (directly from Hercules or via Columbus), DVI (from an external DVI source), or PC (from external computer).
After the video processing, the digital data is sent via a Low Voltage Differential Signalling bus to the LCD panel. LVDS is used to improve data speed and to reduce EMI significantly.
There are two I²C lines and two interrupt and communication lines (TV_IRQ and TV_SC_COM) for the Scaler control. The Scaler communicates with the Hercules as a slave device. To avoid buffer overflow at the Scaler side, the TV_SC_COM line provides the necessary hardware flow control. To allow bi-directional communication, the Scaler can initiate a service interrupt-request to the Hercules via the TV_IRQ line.

The Hercules, and EEPROM are supplied with 3.3 V, which is also present during STANDBY.
The EEPROM, or NVM (Non Volatile Memory) is used to store the settings.

The sound part is built up around the Hercules. The Source Selection, Decoding and Processing are all done by the Hercules.

Power supply input are several DC voltages coming from a supply panel.

9.3 Input/Output

The I/O is divided over two parts: Rear I/O and Side I/O. The rear has two SCART inputs, a PC/DVI-I input (VGA to DVI-I via an external adaptor) and an Audio input. The side has a CVBS and Y/C (SVHS) input, combined with L+R audio inputs, and has also a headphone output.

EXT1: The input of SCART1 is CVBS + RGB + L/R and the output is the video (+ sound) signal from the tuner (SC1_CVBS_RF_OUT).

EXT2: The input of SCART2 is Y/C + CVBS + L/R. The output signal is CVBS_SC2_MON_OUT (+ sound).
SCART2 is meant for VCR and has therefore some additional signals in relation to EXT1 but no RGB: it has the possibility for Y/C_in: Y_in on pin 20 and Chroma_in on pin 15.
The selection of the external I/O's is controlled by the Hercules.

PC In (DVI-I, or VGA via external VGA to DVI-I adaptor): This input is directly going to the Scaler IC. See paragraph "Video: Scaler Part".

9.4 Tuner and IF

A Philips UV1318 Tuner is used in the TV board. The SIF signals are decoded by the Hercules. Tuning is done via I²C.

9.4.1 Video IF Amplifier

The IF-filter is integrated in a SAW (Surface Acoustic Wave) filter. One for filtering IF-video (1104, in some models: 1105) and one for IF-audio (1106). The type of these filters depends on the standard(s) that has/have to be received.

The output of the tuner is controlled via an IF-amplifier with AGC-control. This is a voltage feedback from pin 31 of the Hercules to pin 1 of the tuner. The AGC-detector operates on top sync and top white level. AGC take-over point is adjusted via the service alignment mode 'Tuner' - 'AGC'. If there is too much noise in the picture, then it could be that the AGC setting is wrong. The AGC-setting could also be mis-aligned if the picture deforms with perfect signal; the IF-amplifier amplifies too much.

9.5 Video: TV Part (Diagrams B1, B2, and B3)

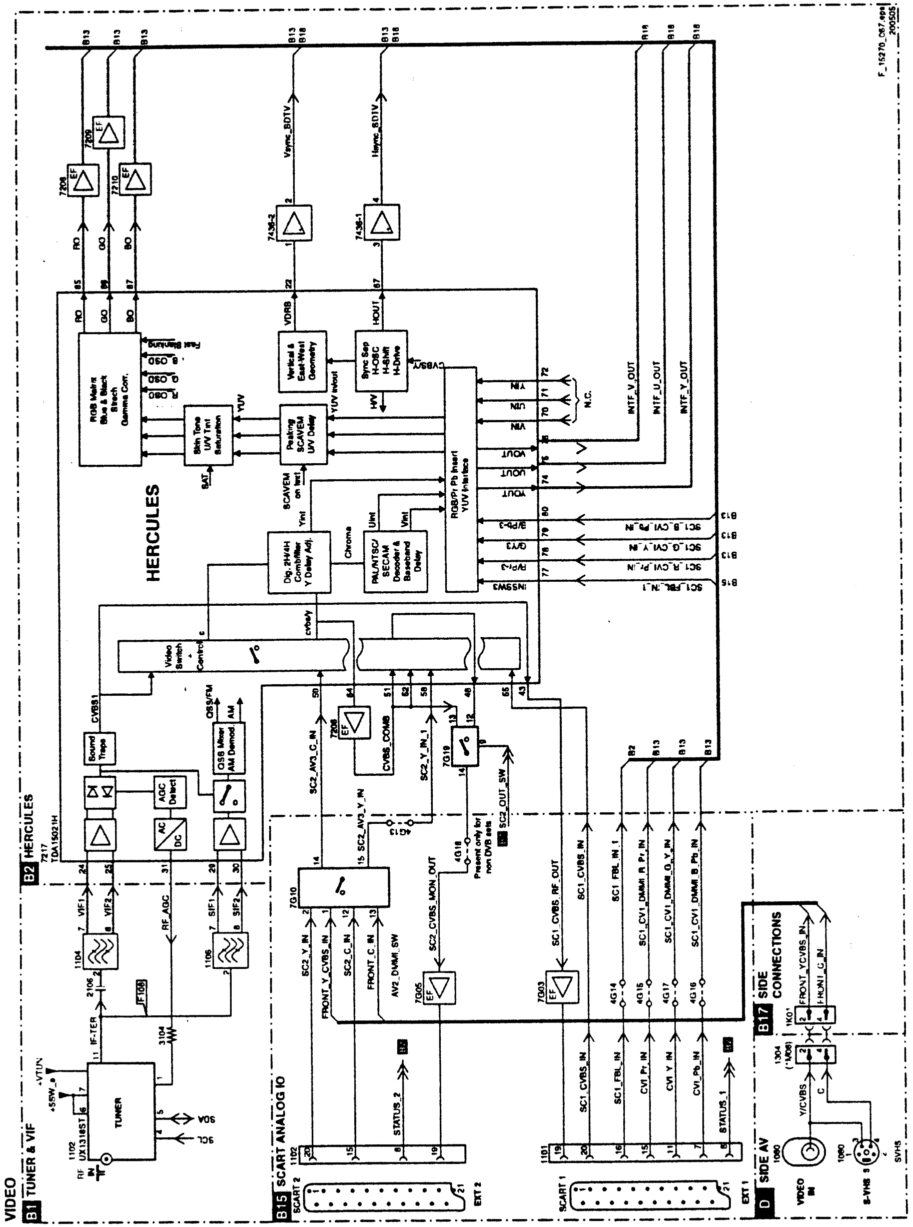

VIDEO
B1 TUNER & VIF
B2 HERCULES
B15 SCART ANALOG IO
B17 SIDE CONNECTIONS
D SIDE AV
HERCULES
7217 TDA15021H
TUNER
1102 UV1318ST
1104
1106
2106
3104
IF-TER
RF_AGC
VIF1
VIF2
SIF1
SIF2
AGC Detect
Sound Traps
QSS Mixer AM Demod. AM
Video Switch + Control
Dig. 2H/4H Combfilter Y Delay Adj.
PAL/NTSC/ SECAM Decoder & Baseband Delay
Skin Tone UV Tint Saturation
Peaking SCAVEM UV Delay
RGB Matrix Blue & Black Stretch Gamma Corr.
Vertical & East-West Geometry
Sync Sep. H-OSC H-Shift H-Drive
RGB/YPrPb Insert YUV Interface
Vsync_BDTV
Hsync_BDTV
7206
7209
7210
7436-1
7436-2
7208
7010
7019
7003
7005
SC1_CVBS_IN
SC1_FBL_IN_1
SC1_CVI_DMMI_R_Pr_IN
SC1_CVI_DMMI_G_Y_IN
SC1_CVI_DMMI_B_Pb_IN
SC1_CVBS_RF_OUT
SC2_AV2_C_IN
SC2_AV2_Y_IN
SC2_Y_IN
SC2_C_IN
SC2_Y_IN_1
SC2_CVBS_MON_OUT
SC2_OUT_SW
CVBS_COMB
FRONT_Y_CVBS_IN
FRONT_C_IN
AV2_DMMI_SW
INTF_V_OUT
INTF_U_OUT
INTF_Y_OUT
STATUS_1
STATUS_2
SCART 1
SCART 2
EXT 1
EXT 2
VIDEO IN
S-VHS
Present only in non DVB sets
N.C.
F_15270_057.eps 200505

Figure 9-3 Block diagram video processing

The video processing is completely handled by the Hercules

- IF demodulator.
- Chrominance decoder
- Sync separator.
- Horizontal & vertical drive.
- RGB processing.
- CVBS and SVHS source select.

It has also built-in features like:

- CTI.
- Black stretch.
- Blue stretch.
- White stretch.
- Slow start up.
- Dynamic skin tone correction etc.

Further, it also incorporates sound IF traps and filters, and requires only one crystal for all systems.

9.6 Columbus

9.6.1 Introduction

The Columbus is a combination of:

- A **2D/3D Comb filter** for both PAL and NTSC, and
- A **spatial/temporal noise reduction system** for both colour and luminance signals.

The Columbus 3D Comb filter uses digitalised CVBS, U, and V (or C) signals and can be used with or without an external 16 Mbit SDRAM. Without external 16Mbit SDRAM, 3D comb filtering and temporal noise reduction are not possible.

The noise reduction part of the Columbus is controlled by the FBX software using the SNERT interface. The 2D/3D Comb filter part is controlled by the Main software using the I^2C bus.

9.6.2 2D/3D Comb Filter

Introduction

The "3D Comb filter Columbus" is a combined 2D/3D Comb filter function that is part of the Columbus chip (circuit diagram B19, item 7M00). It is a comb filter for both PAL and NTSC.

The 3D Comb filter is used to separate chroma and luminance components out of a CVBS signal. It is of no use when the CVBS signal is a SECAM signal (SECAM signals cannot be combed) The Columbus chip can be used with or without 16 Mbit external SDRAM (circuit diagram B10, item 7B01). When an external SDRAM is connected to the IC, the Comb filter function can work in combined 2D/3D processing (depending on the detected pixel based motion). When no external SDRAM is connected, only 2D Comb filtering is possible.

The Columbus can comb the following standard signals:

- PAL B, PAL G, PAL H, PAL I, PAL D, PAL K: Colour standard PAL, Colour carrier at 4.43 MHz, field frequency: 50 Hz
- PAL M: Colour standard PAL, Colour carrier at 3.58 MHz, field frequency: 60 Hz
- PAL N: Colour standard PAL, Colour carrier at 3.58 MHz, field frequency: 50 Hz
- NTSC M: Colour standard NTSC, Colour carrier at 3.58 MHz, field frequency: 60 Hz

For NTSC signals, the PAL delay line must always be bypassed.

The following signals CANNOT be combed:

- Double Window signals or Multi PIP. For these signals, only one part or even no part of the signal is in relation with the burst. The part that is not in relation with the burst can become very blurred when combed by the Columbus Comb filter. Such a signal must be bypassed. Notch mode is not even an option since e.g. in double window, one part can be a PAL signal while the other part is NTSC or SECAM.
- In cases where a SECAM signal is presented to the Columbus Comb filter; both the luminance and UV path must be bypassed. The PAL delay line inside the Columbus cannot be used for SECAM signals so it must also be bypassed. The luminance path must have luminance at its input instead of CVBS. A chroma delay line outside Columbus must be used for SECAM signals. Reason for this: the Columbus PAL delay line halves the output of the chroma signals in case of SECAM.
- Y/C, YPbPr, and RGB signals do not have to be combed. So both the luminance and UV path must be bypassed. The PAL delay line will also be bypassed.
- In cases where the Columbus Comb filter does not receive a CVBS signal with burst at the right place according to the standard (this includes black and white signals without burst), phase correction results become unpredictable and the Comb filter must be set in bypass (= luminance path bypassed, UV path bypassed, PAL delay line bypassed)
- VCR signals cannot be combed and must be processed in notch mode, or bypassed.

Columbus Modes

The several modes of the Columbus 3D Comb filter are:

- Bypass mode.
- Band-Pass-Notch mode.
- 2D Comb filter modes.
  - Simple median.
  - Median.
- Field Comb filter mode.
- Frame Comb filter mode.

Bypass Mode

The 3D Comb filter can be set in bypass mode. In this mode, the CVBS, U and V signals are just bypassed to the output.

Band-Pass-Notch Mode

This is a mode where no Comb filtering is applied. A "Band Pass Filter" is used to filter the chroma information out of the CVBS signal. A "Notch Filter" is used to subtract the sub carrier out of the CVBS in order to make a luminance signal without chroma sub carrier.

In terms of cross colour and cross luminance, this mode has the worst performance of all. It is only used on these signals where no comb filtering can be applied (non-standard signals and most VCR signals for example).

2D Comb Filter Modes

A Comb filter does an action on a current pixel and a delayed pixel. When the delayed pixel is a line-delayed pixel, we talk about a "Spatial or 2D Comb Filter" (for NTSC the delay must be 1 line, for PAL it must be 2 lines).

Spatial or 2D Comb filters show problems on vertical colour transients and on single coloured lines. For these situations, extra hardware is added in the Columbus chip to avoid these kinds of problems. However even with these extra measures, there are still situations where the 2D Comb filter does not perform optimally (diagonal resolution and single lines with equal luminance content). In order to restrict the working area of the 2D Comb filter to the frequencies where the sub carrier is present, a horizontal band pass filter always precedes a 2D Comb filter.

When a 2D Comb filter has no extra hardware to avoid problems at vertical colour transients (or this extra hardware is switched "off"), the Comb filter is called a "simple median filter". When there is extra hardware to avoid these kinds of problems, the filter is called a "median filter".

Field Comb Filter Mode

A Comb filter does an action on a current pixel and a delayed pixel. When the delayed pixel is a field-delayed pixel, we talk about a "Field Comb Filter". Field Comb filters are only for PAL of commercial interest.

Field Comb filters show also problems on vertical colour transients and on motion. For the vertical transients, a hanging dots detector has been added, however the performance on vertical transients of the field Comb filter, even with this hanging dots detector, is worse than the performance of the 2D Comb filter. On motion, the field Comb filter performs very badly. A motion detector must detect the pixels where there is motion and on these pixels, the Comb filter must be forced back to 2D Comb filter mode. This switching back is not implemented with a hard switch, but with a motion controlled fader. When there is a lot of motion, the fader will take a lot of the 2D Comb filter output, when there is less motion, more field-combed signal will be taken.

A field Comb filter is also called a "vertical-temporal filter" because it filters in the vertical and temporal direction.

Frame Comb Filter Mode

A Comb filter does an action on a current pixel and a delayed pixel. When the delay is a frame, we talk about a "Frame Comb Filter". For NTSC we need a delay of one frame, for PAL however the delay must be two frames.

Frame Comb filters have the best performance, but just like the Field Comb filter, they perform very badly on motion. A motion detector will have to detect motion and on these motion pixels, 2D Comb filtering will have to be applied. A frame Comb filter is a pure "temporal filter".

The Columbus needs an external memory connected to it, before it can do a temporal or vertical-temporal Comb filter action. When no external memory is connected, field or frame Comb filtering is impossible.

Block Diagram

In the next block diagram, two main parts of the Columbus 2D/3D Comb filter can be seen:

- The upper part is what is called the luminance Comb filter. It tries to make an as clean as possible luminance signal out of the CVBS signal at the input.
- The lower part receives U and V signals (sequentially) that are normally only band pass filtered in front of the 3D Comb filter. It filters all left over luminance signals out of it, in order to make an as clean as possible U and V signal.

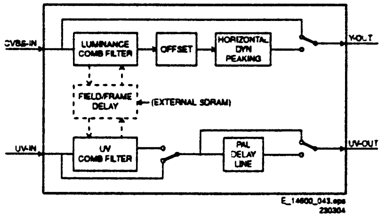


Figure 9-4 Columbus 2D/3D Comb Filter block diagram

The Comb filter has two inputs. One is the CVBS where clean luminance (Y) will be extracted from; the other one is UV where a clean U and V signal will be extracted. Both input signals are digital signals.

The field or frame delay is used for the Field and Frame Comb filter mode. An external memory connected to the Columbus IC provides this delay.

Phase correction is done at the inputs of both the Comb filter blocks. There is a phase correction for spatial filtering (called the spatial phase corrector) and a separate phase correction on the signals used for temporal (Frame or Field) Comb filtering (called the temporal phase corrector).

The offset block receives the motion dependant 2D/3D Comb filtered signal as input. The black level of the luminance signal is restored and the result is output. The black level restoration is corrected continuously. However, on VCR signals, this restoration can become unstable. Therefore, on VCR signals, a fixed black level restoration value must be forced.

A horizontal dynamic peaking can be done on the luminance signal. This peaking is adaptive in order not to amplify any cross luminance distortion. It detects where there could be left over sub carrier in the luminance signal and reduces the peaking over there. The detection of the left over cross luminance is different depending on the pre-filter or post-filter mode.

The amount of peaking and coring can be chosen. The peaking algorithm behind it is a simplified copy of the luminance peaking of picnic. After the peaking block, the signal is output as clean luminance.

The bypass switches have the obvious purpose of bypassing the input signal, in case no Comb filtering is wanted.

A PAL delay line is added in the UV path. This is done because a delay line in front of the 3D Comb filter does need an extra vertical filter action on the UV signals. This vertical filtering deteriorates the vertical transient performance for colours. The Columbus Comb filter cannot undo this. However, this reduction in performance can be omitted by putting the PAL delay line after the 3D Comb filter block.

For PAL signals, the PAL delay line in front of the Columbus 3D Comb filter is bypassed and the Columbus delay line is switched "on". In cases where the delay line in front of Columbus cannot be bypassed, the Columbus PAL delay line is bypassed.

For NTSC signals, the PAL delay line is bypassed as usual.

9.6.3 Noise Reduction and Noise Estimator

The noise reduction function is a sophisticated successor of the noise reduction module from the PICNIC-chip, also known as "LIMERIC".

Besides the noise reduction part, the Columbus noise reduction module also comprises a noise estimator. This noise estimator (the LORE-noise estimator) is a new design with the ambition of more accuracy and with less control complexity than the existing noise estimators.

9.7 Video: Scaler Part (Diagram B7, B8 and B9)

The Genesis gm1501 Scaler is a dual channel graphics and video processing IC for LCD monitors and televisions incorporating Picture in Picture, up to SXGA output resolutions. The Scaler controls the display processing in an LCD TV, e.g. like the deflection circuit in a CRT-based TV. It controls all the view modes (e.g. like "zooming" and "shifting"). Features like PC (VGA) or HD inputs, are also handled by this part.

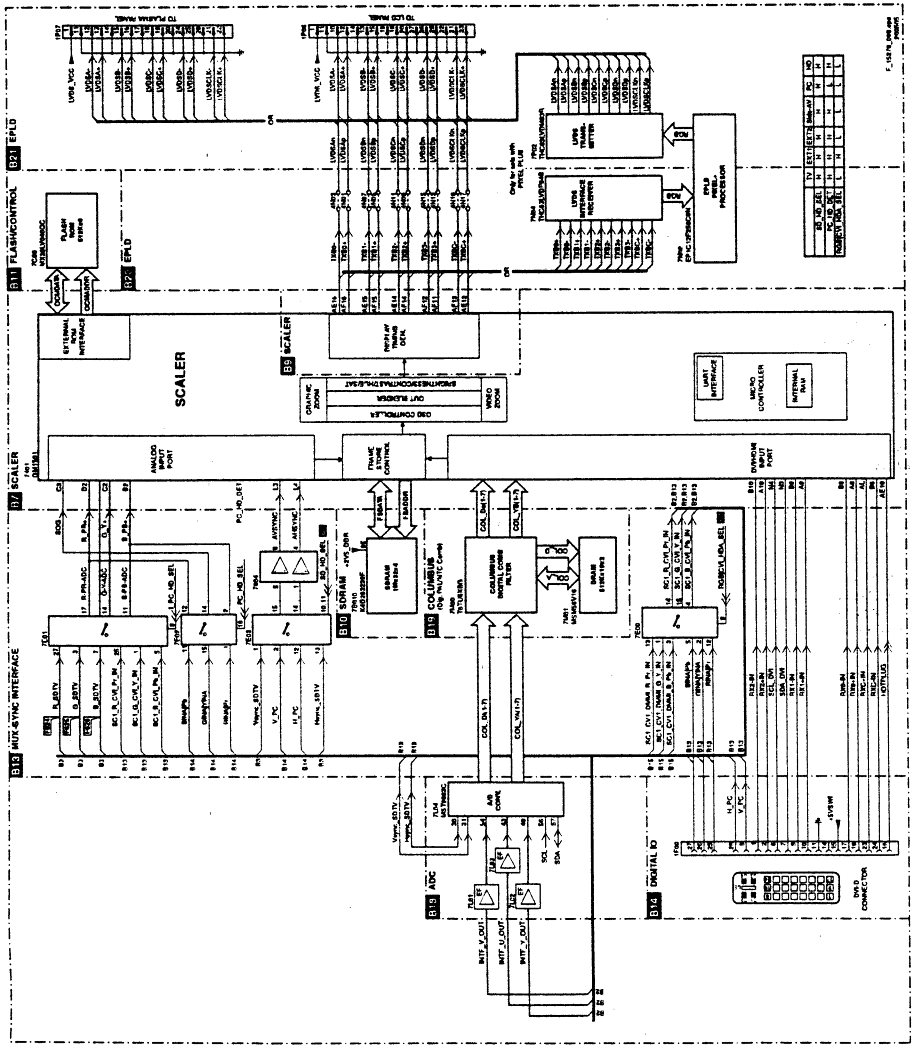


Figure 9-5 Block diagram scaler part

9.7.1 Teletext Path

In Pixel Plus and Digital Crystal Clear models, which have an ADC (B18) and Columbus 3D combfilter (B19), the digital input of the scaler is used for the digital video signal (Columbus output), whereas the analogue RGB input input of the scaler is used for teletext. This means that no mixed mode (video plus teletext simultaneously) is possible. In Crystal Clear models, which do not have an ADC and Columbus, the analogue RGB input of scaler is used for both video and teletext (generated by the Hercules). The digital input of the Scaler is not used in Crystal Clear TV sets. See also the block diagrams at the beginning of this chapter. When faultfinding, checking the teletext path may be useful: if there is sound and teletext, but no video and user menu (blank screen), the digital path (Hercules - ADC - Columbus - Scaler) is faulty. If there is sound but no teletext, the back-end part (Scaler - LCD panel) is faulty.

9.7.2 Features

The Scaler provides several key IC functions:

- Scaling.
- Auto-configuration/ Auto-Detection.
- Various Input Ports:
  - Analog RGB.
  - Video Graphics.
- Integrated LVDS Transmitter.
- On-chip Micro-controller

9.7.3 Inputs

Analog RGB

The RGB input is fed to pins B2, C2 and D2 of the Scaler IC (Genesis GM1501, item 7801, see circuit diagram B8). This input consists of either the Hercules RGB output or the RGB/ YpbPr input of the VGA connector. The Scaler can switch between the two signals via the PC_HD_SEL signal and selection IC SM5301 (see circuit diagram B13).

PC (VGA) Input

The VGA input is processed by the VGA block of the Scaler. The Scaler supports pixel frequencies up to 165MHz. YpbPr format is also supported via the VGA interface and covers a resolution of 480p/560p/720p/1080i.

9.7.4 Output

The Display Output Port provides data and control signals that permit the Scaler to connect to a variety of display devices using a TTL or LVDS interface. The output interface is configurable for single or dual wide TTL/LVDS in 18, 24 or 30-bit RGB pixels format. All display data and timing signals are synchronous with the DCLK output clock. The integrated LVDS transmitter is programmable to allow the data and control signals to be mapped into any sequence depending on the specified receiver format.

9.8 Audio Processing

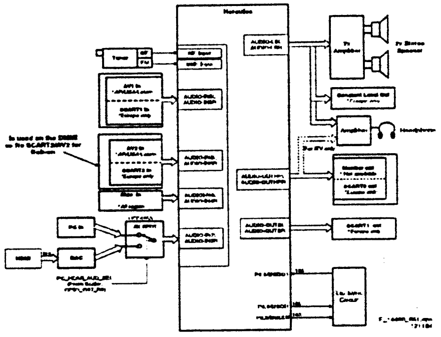


Figure 9-6 Block diagram audio processing

The audio decoding is done entirely via the Hercules. The IF output from the Tuner is fed directly to either the Video-IF or the Sound-IF input depending on the type of concept chosen. There are mainly two types of decoder in the Hercules, an analogue decoder that decodes only Mono, regardless of any standards, and a digital decoder (or DEMDEC) that can decode both Mono as well as Stereo, again regardless of any standards.

In this chassis, the analogue decoder is used in two cases:

- It is used for AM Sound demodulation in the Europe SECAM LL' transmission.
- It is used for all FM demodulation in AV-Stereo sets.

9.8.1 Diversity

The diversity for the Audio decoding can be broken up into two main concepts:

- The Quasi Split Sound concept used in Europe and some AP sets.
- The Inter Carrier concept, used in NAFTA and LATAM.

The UOC-III family makes no difference anymore between QSS- and Intercarrier IF, nearly all types are software-switchable between the two SAW-filter constructions.

Simple data settings are required for the set to determine whether it is using the Inter Carrier or the QSS concept. These settings are done via the "QSS" and "FMI" bit found in SAM mode. Due to the diversity involved, the data for the 2 bits are placed in the NVM location and it is required to write once during startup.

On top of that, it can be further broken down into various systems depending on the region. The systems or region chosen, will in turn affect the type of sound standard that is/are allowed to be decoded.

- For the case of Europe, the standard consists of BG/DK/I/LL' for a Multi-System set. There are also versions of Eastern Europe and Western Europe set and the standard for decoding will be BG/DK and I/DK respectively. FM Radio is a feature diversity for the Europe sets. The same version can have either FM Radio or not, independent of the system (e.g. sets with BG/DK/I/LL' can have or not have FM radio).
- For the case of NAFTA and LATAM, there is only one transmission standard, which is the M standard. The diversity then will be based on whether it has a dBx noise reduction or a Non-dBx (no dBx noise reduction).
- For the case of AP, the standard consists of BG/DK/I/M for a Multi-System set. The diversity here will then depend on

the region. AP China can have a Multi-System and I/DK version. For India, it might only be BG standard.

9.8.2 Functionality

The features available in the Hercules are as follows:

- Treble and Bass Control.
- Surround Sound Effect that includes:
  - Incredible Stereo.
  - Incredible Mono.
  - 3D Sound (not for AV Stereo).
  - TruSurround (not for AV Stereo).
  - Virtual Dolby Surround, VDS422 (not for AV Stereo).
  - Virtual Dolby Surround, VDS423 (not for AV Stereo).
  - Dolby Pro-Logic (not for AV Stereo).
- Bass Feature that includes:
  - Dynamic Ultra-Bass.
  - Dynamic Bass Enhancement.
  - BBE (not for AV Stereo).
- Auto-Volume Leveler.
- 5 Band Equalizer.
- Loudness Control.

All the features stated are available for the Full Stereo versions and limited features for the AV Stereo

9.8.3 Audio Amplifier

The audio amplifier part is very straightforward. It uses two integrated TDA8931T power amplifiers for the L and R channels; each amplifier IC is able to deliver a maximum output of 20 W_{RMS} continuously in a 4-6 ohm speaker without needing a heatsink.
The operating supply for the amplifier may range from 12 V to 32 V; in the LC04x TV set, depending on the model, supply voltages of 18 V (for the 5 W / 8 ohm version) or 24 V (for the 15 W / 4 ohm version) are used.
Muting is done via the SOUND_ENABLE line connected to pins 7 of both amplifier-ICs, which comes from the Hercules.

9.8.4 Audio: Lip Sync

No Lip Sync adjustments are neccessary in this model.

9.9 Control

9.9.1 Hercules

The System Board has two main micro-controllers on board. These are:

- On-chip x86 micro-controller (OCM) from Genesis LCD TV/ Monitor Controller.
- On-chip 80C51 micro-controller from Philips Semiconductor UOCIII (Hercules) series.

Each micro-controller has it own I²C bus which hosts its own internal devices.
The Hercules is integrated with the Video and Audio Processor. For dynamic data storage, such as SMART PICTURE and SMART SOUND settings, an external NVM IC is being used. Another feature includes an optional Teletext/Closed Caption decoder with the possibility of different page storage depending on the Hercules type number.

9.9.2 Block Diagram

The block diagram of the Micro Controller application is shown below.

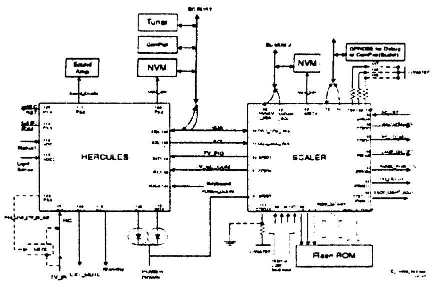


Figure 9-7 Micro Controller block diagram

9.9.3 Basic Specification

The Micro Controller operates at the following supply voltages:

- +3.3 V_{DC} at pins 4, 88, 94, and 109.
- +1.8 V_{DC} at pins 93, 96, and 117.
- I²C pull up supply: +3.3V_{DC}.

9.9.4 Pin Configuration and Functionality

The ports of the Micro Controller can be configured as follows:

- A normal input port.
- An input ADC port.
- An output Open Drain port.
- An output Push-Pull port.
- An output PWM port.
- Input/Output Port

The following table shows the ports used for the LC04 control:

Table 9-2 Micro Controller ports overview

Pin	Name	Description	Configuration
97	INT0/ P0.5	IR	INT0
98	P1.0/ INT1	TV_IRQ	INT2
99	P1.1/ T0	TV_SC_COM	P1.1
102	P0.4/ I2SWS	EXT_MUTE	P0.4
103	P0.3/ I2SCLK	Lip Sync	I2SCLK
104	P0.2/ I2SDO2	NVM_WP	P0.2
105	P0.1/ I2SDO1	Lip Sync	I2SDO1
106	P0.0/ I2SDI/O	Lip Sync	I2SDI/O
107	P1.3/ T1	PC-TV_LED	P1.3
108	P1.6/ SCL	SCL	SCL
109	P1.7/ SDA	SDA	SDA
111	P2.0/ TPWM	SOUND_ENABLE	P2.0
112	P2.1/ PWM0	(for future use)	-
113	P2.2/ PWM1	(for future use)	-
114	P2.3/ PWM2	SEL_IF	P2.3
115	P3.0/ ADC0	Light Sensor - SDM	ADC0
116	P3.1/ ADC1	STATUS_1	ADC1
119	P3.2/ ADC2	STATUS_2	ADC2
120	P3.3/ ADC3	KEYBOARD	ADC3
122	P2.4/ PWM3	STANDBY	P2.4
123	P2.5/ PWM4	(for future use)	-
126	P1.2/ INT2	(for future use)	-
127	P1.4/ RX	HERC_RESET	-
128	P1.5/ TX	POWER_DOWN	P1.5

The description of each functional pin is explained below:

- **LED.** This signal is used as an indication for the Standby, Remote and Error Indicator. Region diversity:
  - During protection mode, the LED blinks and the set is in standby mode.
  - During error conditions it blinks at a predefined rate.
  - After receiving a valid RC-5 or local keyboard command it flashes once.
  - For sets with error message indication, the LED blinks when message is active and the set is in standby mode.
- **SCL.** This is the clock wire of the two-wire single master bi-directional I²C bus.
- **SDA.** This is the data wire of the two-wire single master bi-directional I²C bus.
- **STANDBY.** The Hercules generates this signal. This can enable the power supply in normal operation and disable it during Standby. It is of logic "high" (3.3 V) under normal operation and "low" (0 V) during Standby.
- **IR.** This input pin is connected to an RC5 remote control receiver.
- **SEL-IF.** This is an output pin to switch the Video SAW filter between M system and other systems.
  - 0: NTSC M (default)
  - 1: PAL B/G, DK, I, L
- **NVM_WP.** The global protection line is used to enable and disable write protection to the NVM. When write to the NVM is required, pin 7 of the NVM must be pulled to logic '0' first (via Write_Protect of the micro-controller pin) before a write is performed. Otherwise pin 7 of NVM must always be at logic "1"
  - 0: Disabled
  - 1: Enabled (default)
- **SOUND_ENABLE.** This pin is used to MUTE the audio amplifier. It is configured as push pull.
- **STATUS_1.** This signal is used to read the status of the SCART 1 input.
- **STATUS_2.** This signal is used to read the status of the SCART 2 input.
- **HERC_RESET.** This pin is used to switch the +1.8V supply.
- **POWER_DOWN.** The power supply generates this signal. Logic "high" (3.3 V) under normal operation of the TV and goes "low" (0 V) when the Mains input voltage supply goes below 70 V_{AC}.
- **KEYBOARD.** Following are the Keyboard functions and the step values (8 bit) for it.

Table 9-3 Local keyboard values

Function	Voltage (V_{DC})	Step values (8 bit)
NAFTA Standby	0	0 - 6
Ch +	0.43	7 - 33
Exit Factory (Ch- and Vol-)	0.69	34 - 53
Ch -	0.93	54 - 73
Menu (Vol - and Vol +)	1.19	74 - 96
Vol -	1.49	97 - 121
DVD Eject	1.8	122 - 147
Vol +	2.12	148 - 169

- **TV_IRQ.** This signal is the interrupt from the Scaler IC.
- **TV_SC_COM.** This signal is used for the communication with the Scaler IC.
- **EXT_MUTE.** This signal is used to reduce the Switch-off plop.

9.10 Abbreviation List

0/6/12	SCART switch control signal on A/V board. 0 = loop through (AUX to TV), 6 = play 16:9 format, 12 = play 4:3 format
1080i	1080 visible lines, interlaced
1080p	1080 visible lines, progressive scan
2CS	2 Carrier Sound (or 2 Channel Stereo)
480i	480 visible lines, interlaced
480p	480 visible lines, progressive scan
ACI	Automatic Channel Installation: algorithm that installs TV channels directly from a cable network by means of a predefined TXT page
ADC	Analogue to Digital Converter
AFC	Automatic Frequency Control; Control signal used to tune and lock to the correct frequency
AGC	Automatic gain control (feedback) signal to the tuner. This circuit ensures a constant output amplitude regardless of the input amplitude
AM	Amplitude Modulation; A "data encoding to a carrier" method, such that the carrier amplitude is proportional to the data value
AP or A/P	Asia Pacific
AR	Aspect Ratio: 4 by 3 or 16 by 9
ASD	Automatic Standard Detection
AV	External Audio Video
B-SC1-IN	Blue SCART1/EXT1 in
B-SC2-IN	Blue SCART2/EXT2 in
B-TXT	Blue TeleteXT
B/G	Monochrome TV system. Sound carrier distance is 5.5 MHz. B= VHF-band, G= UHF-band
BOCMA	Bimos one Chip Mid-end Architecture: video and chroma decoder
C-FRONT	Chrominance front input
CBA	Circuit Board Assembly (also called PCB or PWB)
CL	Constant Level: audio output to connect with an external amplifier
CLUT	Colour Look-Up Table
COLUMBUS	COLour LUMinance Baseband Universal Subsystem. IC performing noise reduction and 2D/3D comb filtering
ComPair	Computer aided rePair. A tool for diagnosing a TV through a PC controlled interface
CSM	Customer Service Mode
CVBS	Composite Video and Blanking Signal; A single video signal that contains luminance, colour, and timing information
CVBS-EXT	CVBS signal from external source (VCR, VCD, etc.)
CVBS-INT	CVBS signal from internal Tuner
CVBS-MON	CVBS monitor signal
CVBS-TER-OUT	CVBS TERrestrial OUTput signal
DAC	Digital to Analogue Converter
DBE	Dynamic Bass Enhancement: extra low frequency amplification
DFU	Directions For Use: Owner's manual
DNR	Dynamic Noise Reduction / Digital Noise Reduction; Noise reduction feature of the set
DRAM	Dynamic RAM; dynamically refreshed RAM
DSP	Digital Signal Processing
DST	Dealer Service Tool; Special remote control designed for dealers to enter

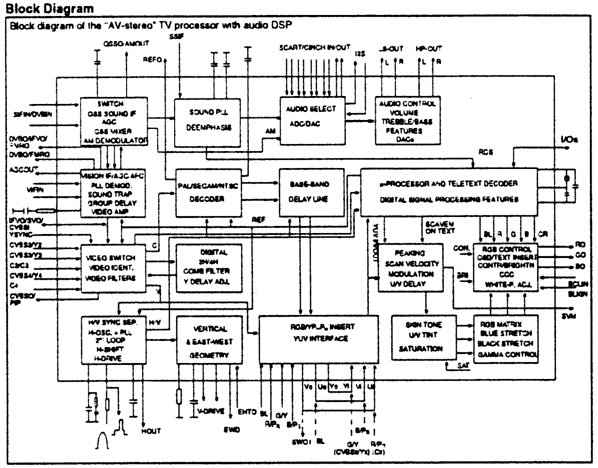
	e.g. service mode (a DST-emulator is available in ComPair)
DTS	Digital Theatre System; A multi-channel surround sound format, similar to Dolby Digital
DVD	Digital Versatile Disc
EEPROM	Electrically Erasable and Programmable Read Only Memory
EPG	Electronic Program Guide: system used by broadcasters to transmit TV guide information (= NexTView)
EU	Europe
EXT	EXTernal (source), entering the set by SCART or by cinches (jacks)
FBL	Fast BLanking; DC signal accompanying RGB signals. To blank the video signal when it is returning from the right side of the screen to the left side. The video level is brought down below the black video level
FBL-SC1-IN	Fast blanking signal for SCART1 in
FBL-SC2-IN	Fast blanking signal for SCART2 in
FBL-TXT	Fast Blanking Teletext
FM	Field Memory; A memory chip that is capable of storing one or more TV picture fields / Frequency Modulation; A technique that sends data as frequency variations of a carrier signal
FMR	Radio receiver that can receive the FM Band 87.5 - 108 MHz
FRC	Frame Rate Converter
FRONT-C	Front input chrominance (SVHS)
FRONT-DETECT	Control line for detection of headphone insertion, Service Mode jumper, power failure detection
FRONT-Y_CVBS	Front input luminance or CVBS (SVHS)
G-SC1-IN	Green SCART1/EXT1 in
G-SC2-IN	Green SCART2/EXT2 in
G-TXT	Green teletext
H	H_sync to the module
HA	Horizontal Acquisition; horizontal sync pulse
HD	High Definition
HP	HeadPhone
I	Monochrome TV system. Sound carrier distance is 6.0 MHz. VHF- and UHF-band
I^2C	Integrated IC bus
I^2S	Integrated IC Sound bus
IC	Integrated Circuit
IF	Intermediate Frequency
Interlaced	Scan mode where two fields are used to form one frame. Each field contains half the number of the total amount of lines. The fields are written in "pairs", causing line flicker.
IR	Infra Red
IRQ	Interrupt ReQuest
Last Status	The settings last chosen by the customer and read and stored in RAM or in the NVM. They are called at start-up of the set to configure it according to the customer's preferences
LATAM	LATin AMerica
LC04	Philips chassis name for LCD TV 2004 project
LCD	Liquid Crystal Display
LED	Light Emitting Diode; A semiconductor diode that emits light when a current is passed through it
LINE-DRIVE	Horizontal (line) deflection drive signal (for the Line transistor)
L/L'	Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I
LS	LoudSpeaker
LVDS	Low Voltage Differential Signalling, data transmission system for high speed and low EMI communication.
M/N	Monochrome TV system. Sound carrier distance is 4.5 MHz. M= 525 lines @ 60 Hz, N= 625 lines @ 50 Hz
MOSFET	Metal Oxide Semiconductor Field Effect Transistor
MPEG	Motion Pictures Experts Group. An ISO/IEC body that has given its name to an image compressing scheme for moving video
MSP	Multi-standard Sound Processor: ITT sound decoder
MUTE	MUTE Line
NC	Not Connected
NICAM	Near Instantaneously Companded Audio Multiplexing; This is a digital sound system, mainly used in Europe
NTSC	National Television Standard Committee. Colour system used mainly in North America and Japan. Colour carrier NTSC M/N = 3.579545 MHz, NTSC 4.43 = 4.433619 MHz (this is a VCR norm, it is not transmitted off-air)
NVM	Non Volatile Memory; IC containing data such as alignment values, preset stations
O/C	Open Circuit
ON/OFF LED	On/Off control signal for the LED
OSD	On Screen Display
PAL	Phase Alternating Line. Colour system used mainly in Western Europe (colour carrier = 4.433619 MHz) and South America (colour carrier PAL M = 3.575612 MHz and PAL N = 3.582056 MHz)
PC	Personal Computer
PCB	Printed Circuit Board (or PWB)
PIG	Picture In Graphic
PIP	Picture In Picture
PLL	Phase Locked Loop. Used, for example, in FST tuning systems. The customer can directly provide the desired frequency
Progressive Scan	Scan mode where all scan lines are displayed in one frame at the same time, creating a double vertical resolution.
PWB	Printed Wiring Board (also called PCB or CBA)
RAM	Random Access Memory
RC	Remote Control transmitter
RC5 or 6	Remote Control system 5 or 6, the signal from the remote control receiver
RGB	Red, Green, and Blue colour space; The primary colour signals for TV. By mixing levels of R, G, and B, all colours (Y/C) are reproduced
RGBHV	Red, Green, Blue, Horizontal sync, and Vertical sync
ROM	Read Only Memory
SAM	Service Alignment Mode
SC	SandCastle: two-level pulse derived from sync signals
SC-IN	SCART in
SC-OUT	SCART out
S/C	Short Circuit
SCART	Syndicat des Constructeurs d'Appareils Radiorécepteurs et Téléviseurs; This is a 21-pin connector used in EU, that carries various audio, video, and control signals (it is also called Péritel connector)
SCL	Serial CLock Signal on I^2C bus
SD	Standard Definition
SDA	Serial DAta Signal on I^2C bus
SDRAM	Synchronous DRAM
SECAM	SÉquence Couleur Avec Mémoire; Colour system mainly used in France and East Europe. The chroma is FM modulated and the R-Y and B-Y signals are transmitted line sequentially. Colour carriers= 4.406250 MHz and 4.250000 MHz
SIF	Sound Intermediate Frequency
SMPS	Switched Mode Power Supply
SND	SouND
SNDL-SC1-IN	Sound left SCART1 in
SNDL-SC1-OUT	Sound left SCART1 out
SNDL-SC2-IN	Sound left SCART2 in
SNDL-SC2-OUT	Sound left SCART2 out
SNDR-SC1-IN	Sound right SCART1 in
SNDR-SC1-OUT	Sound right SCART1 out
SNDR-SC2-IN	Sound right SCART2 out
SNDR-SC2-OUT	Sound right SCART2 out
SOPS	Self Oscillating Power Supply
S/PDIF	Sony Philips Digital InterFace; This is a consumer interface used to transfer digital audio
SRAM	Static RAM
STBY	STandBY
SVHS	Super Video Home System
SW	Software or Subwoofer or Switch
THD	Total Harmonic Distortion
TXT	Teletext; TXT is a digital addition to analogue TV signals that contain textual and graphical information (25 rows x 40 columns). The information is transmitted within the first 25 lines during the Vertical Blank Interval (VBI)
uP	Microprocessor
VA	Vertical Acquisition
VL	Variable Level out: processed audio output towards external amplifier
VCR	Video Cassette Recorder
VGA	Video Graphics Array; 640x480 (4:3)
WD	Watch Dog
WYSIWYR	What You See Is What You Record: record selection that follows main picture and sound
XTAL	Quartz crystal
Y	Luminance signal
Y/C	Y consists of luminance signal, blanking level and sync; C consists of chroma (colour) signal
YPbPr	This is a scaled version of the YUV colour space. Y= Luminance, Pb/Pr= Colour difference signals B-Y and R-Y, other amplitudes w.r.t. to YUV
YUV	Colour space used by the NTSC and PAL video systems. Y is the luminance and U/V are the colour difference signals

9.11 IC Data Sheets

This section shows the internal block diagrams and pin layouts of ICs that are drawn as "black boxes" in the electrical diagrams (with the exception of "memory" and "logic" ICs).

9.11.1 Diagram B2, Type TDA15021H (IC7217, Hercules)

Block Diagram


Block diagram of the "AV-stereo" TV processor with audio DSP
SWITCH
QSS SOUND IF
AGC
QSS MIXER
AM DEMODULATOR
SOUND PLL
DEEMPHASIS
AUDIO SELECT
ADC/DAC
AUDIO CONTROL
VOLUME
TREBBLE/BASS
FEATURES
DACs
VISION IF/AGC/AFC
PLL DEMOD.
SOUND TRAP
GROUP DELAY
VIDEO AMP
PAL/SECAM/NTSC
DECODER
BASE-BAND
DELAY LINE
µ-PROCESSOR AND TELETEXT DECODER
DIGITAL SIGNAL PROCESSING FEATURES
VIDEO SWITCH
VIDEO IDENT.
VIDEO FILTERS
DIGITAL
2H/4H
COMB FILTER
Y DELAY ADJ.
PEAKING
SCAN VELOCITY
MODULATION
U/V DELAY
RGB CONTROL
OSD/TEXT INSERT
CONTR/BRIGHTN
CCC
WHITE-P. ADJ.
H/V SYNC SEP.
H-OSC. + PLL
2nd LOOP
H-SHIFT
H-DRIVE
VERTICAL
& EAST-WEST
GEOMETRY
RGB/YPbPr INSERT
YUV INTERFACE
SKIN TONE
U/V TINT
SATURATION
RGB MATRIX
BLUE STRETCH
BLACK STRETCH
GAMMA CONTROL
I/Os
HOUT
EWD
V-DRIVE
RO
GO
BO
SVM

Pin Configuration

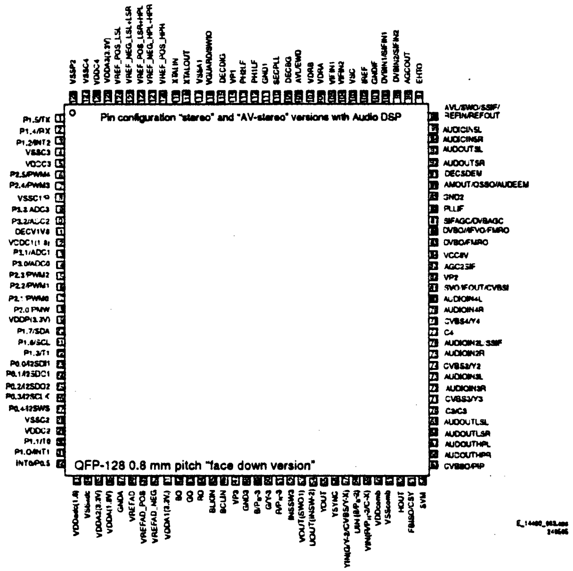

Pin configuration "stereo" and "AV-stereo" versions with Audio DSP
QFP-128 0.8 mm pitch "face down version"
E_14460_063.eps

Figure 9-8 Internal block diagram and pin configuration

9.11.2 Diagram B19, Type T6TU5XB (IC7M00, Columbus)

Figure 1 Package outline (top view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
A	WEB/ DAVB	UVA0 /Di0	UVA2 /Di2	UVA4 /Di4	UVA6 /Di6	UVA8 /Di8	SEL656	TST1	YA2	YA4	YA6	YA8	VA	HREF	SDA	A
B	YB8	VSS	UVA1 /Di1	UVA3 /Di3	UVA5 /Di5	UVA7 /Di7	YA0 /Di9	BISTEN	YA1	YA3	YA5	YA7	WEA/ DAVA	VSS	SCL	B
C	YB7	YB6	VSS	VDDS	VSS	VSS	VDDC	VDDC	VSS	VSS	VDDC	VDDS	VSS	SNDA	SNRST	C
D	YB5	YB4	VDDC	N.C.									VSS	SNCL	TCK	D
E	YB3	YB2	VSS										VDDC	TMS	TDO	E
F	TST2	YB1	VSS										VSS	TRST	TDI	F
G	CLKASB	YB0 /Do9	VDDS										VDDS	A0ICC	RESET	G
H	CLKASA	UVB8/ Do8	TST3										VDDC	CLK EXT	CLKSEL	H
J	UVB7 /Do7	UVB6/ Do6	VSS										VSS	CLK	WEN	J
K	UVB5 /Do5	UVB4/ Do4	VDDC										VSS	CASN	RASN	K
L	UVB3 /Do3	UVB2 /Do2	VSS										VDDS	DQM	DQ16	L
M	UVB1 /Do1	UVB0 /Do0	VDDS										VSS	DQ14	DQ15	M
N	AVD	N.C.	VDDS	VSS	VSS	VDDC	VSS	VDDS	VDDC	VSS	VDDS	VSS	VSS	VDDS	DQ13	N
P	AVS	VSS	A7	A9	A2	A0	A11	DQ7	DQ6	DQ4	DQ3	DQ1	VDDS	VSS	DQ12	P
R	A4	A5	A6	A8	A3	A1	A10	DQ8	VSS	DQ5	VSS	DQ2	DQ9	DQ10	DQ11	R
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	

**COLUMBUS
TOP-VIEW**

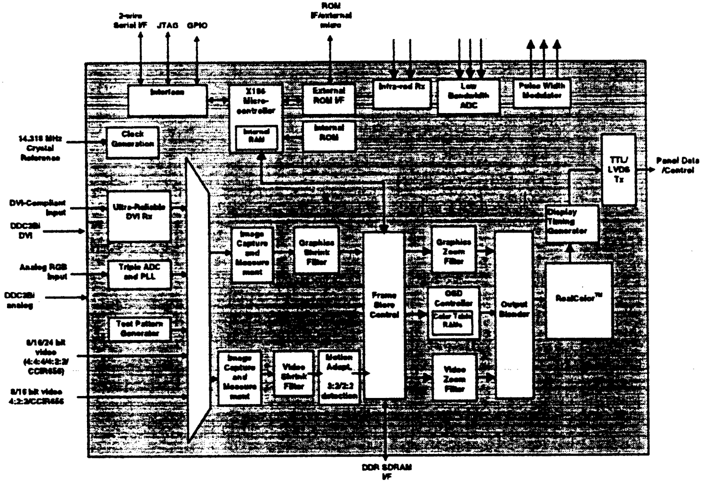
PPA Version 2.7

E_14600_059.eps
200804

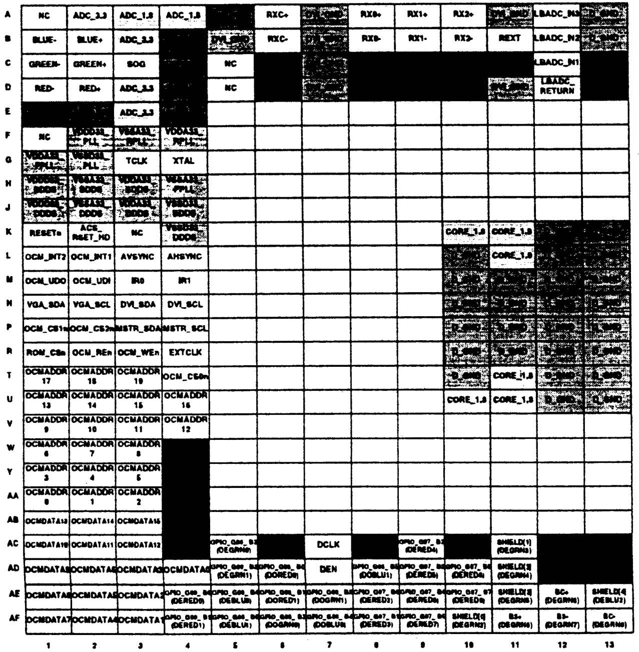
Figure 9-9 Pin configuration

9.11.3 Diagram B7+B8+B9, Type GM1501 (IC7401, Genesis)

Block Diagram


2-wire Serial I/F
JTAG
GPIO
Parallel ROM I/F/external micro
Interface
X186 Micro-controller
Internal RAM
External ROM I/F
Internal ROM
Infra-red Rx
Low Bandwidth ADC
Pulse Width Modulator
14.318 MHz Crystal Reference
Clock Generation
DVI-Compliant Input
DDC2Bi DVI
Ultra-Reliable DVI Rx
Analog RGB Input
Triple ADC and PLL
DDC2Bi analog
Test Pattern Generator
8/16/24 bit video (4:4:4/4:2:2/CCIR656)
8/16 bit video 4:2:2/CCIR656
Image Capture and Measurement
Graphics Shrink Filter
Video Shrink Filter
Motion Adapt. 3:2/2:2 detection
Frame Store Control
Graphics Zoom Filter
OSD Controller
Color Table RAMs
Video Zoom Filter
Output Blender
Display Timing Generator
RealColor™
TTL/ LVDS Tx
Panel Data /Control
DDR SDRAM I/F

Pin Configuration



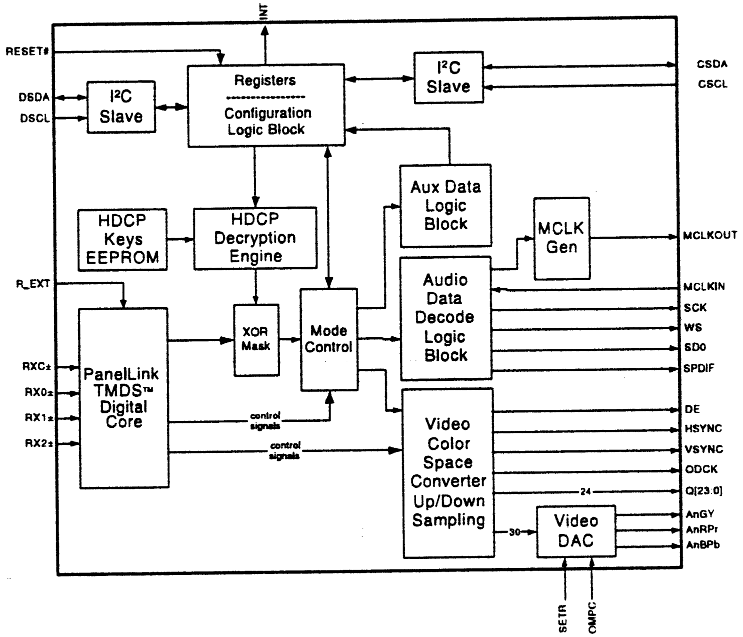
	1	2	3	4	5	6	7	8	9	10	11	12	13
A	NC	ADC_3.3	ADC_1.8	ADC_1.8		RXC+	DVI_GND	RX0+	RX1+	RX2+	DVI_GND	LBADC_IN3	D_GND
B	BLUE-	BLUE+	ADC_3.3		DVI_GND	RXC-	DVI_GND	RX0-	RX1-	RX2-	REXT	LBADC_IN2	D_GND
C	GREEN-	GREEN+	SOG		NC		[illegible]					LBADC_IN1	
D	RED-	RED+	ADC_3.3		NC		DVI_GND				DVI_GND	LBADC_RETURN	
E			ADC_3.3										
F	NC	VDDD33_PLL	VSSA33_RPLL	VDDA33_RPLL									
G	VDDA33_RPLL	VSSD33_PLL	TCLK	XTAL									
H	VDDD33_SDDS	VSSA33_SDDS	VDDA33_SDDS	VSSA33_RPLL									
J	VDDD33_DDDS	VSSA33_DDDS	VDDA33_DDDS	VSSD33_DDDS									
K	RESETn	ACS_RSET_HD	NC	VSSD33_DDDS						CORE_1.8	CORE_1.8	[illegible]	[illegible]
L	OCM_INT2	OCM_INT1	AVSYNC	AHSYNC						D_GND	CORE_1.8	[illegible]	[illegible]
M	OCM_UDO	OCM_UDI	IR0	IR1						D_GND	D_GND	D_GND	D_GND
N	VGA_SDA	VGA_SCL	DVI_SDA	DVI_SCL						D_GND	D_GND	D_GND	D_GND
P	OCM_CS1n	OCM_CS2n	MSTR_SDA	MSTR_SCL						D_GND	D_GND	D_GND	D_GND
R	ROM_CSn	OCM_REn	OCM_WEn	EXTCLK						D_GND	D_GND	D_GND	D_GND
T	OCMADDR 17	OCMADDR 18	OCMADDR 19	OCM_CS0n						D_GND	CORE_1.8	D_GND	D_GND
U	OCMADDR 13	OCMADDR 14	OCMADDR 15	OCMADDR 16						CORE_1.8	CORE_1.8	D_GND	D_GND
V	OCMADDR 9	OCMADDR 10	OCMADDR 11	OCMADDR 12									
W	OCMADDR 6	OCMADDR 7	OCMADDR 8										
Y	OCMADDR 3	OCMADDR 4	OCMADDR 5										
AA	OCMADDR 0	OCMADDR 1	OCMADDR 2										
AB	OCMDATA13	OCMDATA14	OCMDATA15										
AC	OCMDATA10	OCMDATA11	OCMDATA12		GPIO_G06_B2 (DEGRN0)		DCLK		GPIO_G07_B2 (DERED4)		SHIELD(1) (DEGRN3)		
AD	OCMDATA9	OCMDATA6	OCMDATA3	OCMDATA0	GPIO_G06_B3 (DEGRN1)	GPIO_G06_B6 (DORED0)	DEN	GPIO_G06_B5 (DOBLU1)	GPIO_G07_B3 (DERED5)	GPIO_G07_B6 (DERED6)	SHIELD(2) (DEGRN4)		
AE	OCMDATA8	OCMDATA5	OCMDATA2	GPIO_G06_B4 (DERED0)	GPIO_G06_B4 (DEBLU0)	GPIO_G06_B1 (DORED1)	GPIO_G06_B5 (DOGRN1)	GPIO_G07_B6 (DERED2)	GPIO_G07_B4 (DERED6)	GPIO_G07_B7 (DERED8)	SHIELD(3) (DEGRN5)	BC+ (DEGRN6)	SHIELD(4) (DEBLU2)
AF	OCMDATA7	OCMDATA4	OCMDATA1	GPIO_G06_B1 (DERED1)	GPIO_G06_B6 (DEBLU1)	GPIO_G06_B3 (DOGRN0)	GPIO_G06_B4 (DOBLU0)	GPIO_G07_B1 (DERED3)	GPIO_G07_B6 (DERED7)	SHIELD(4) (DEGRN2)	BS+ (DEGRN6)	BS- (DEGRN7)	BC- (DEGRN8)

E_14490_099.eps
241204

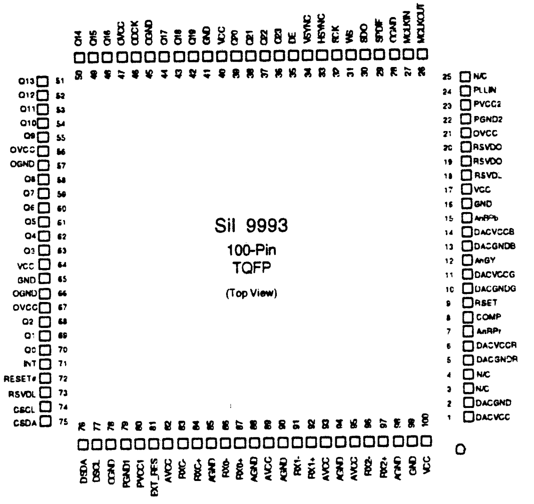
Figure 9-10 Internal block diagram and pin configuration

9.11.4 Diagram B12, Type S9993CT (IC7D03, HDMI Panellink), Reserved

Block Diagram


INT
RESET#
DSDA
DSCL
I²C Slave
Registers
Configuration Logic Block
I²C Slave
CSDA
CSCL
HDCP Keys EEPROM
HDCP Decryption Engine
Aux Data Logic Block
MCLK Gen
MCLKOUT
MCLKIN
R_EXT
RXC±
RX0±
RX1±
RX2±
PanelLink TMDS™ Digital Core
XOR Mask
Mode Control
Audio Data Decode Logic Block
SCK
WS
SD0
SPDIF
control signals
control signals
Video Color Space Converter Up/Down Sampling
DE
HSYNC
VSYNC
ODCK
24
Q[23:0]
30
Video DAC
AnGY
AnRPr
AnBPb
SETR
OMPC

Pin Configuration


Sil 9993
100-Pin
TQFP
(Top View)
1 DACVCC
2 DACGND
3 N/C
4 N/C
5 DACGNDR
6 DACVCCR
7 AnRPr
8 COMP
9 RSET
10 DACGNDG
11 DACVCCG
12 AnGY
13 DACGNDB
14 DACVCCB
15 AnBPb
16 GND
17 VCC
18 RSVDL
19 RSVDO
20 RSVDO
21 OVCC
22 PGND2
23 PVCC2
24 PLLIN
25 N/C
26 MCLKOUT
27 MCLKIN
28 OGND
29 SPDIF
30 SD0
31 WS
32 SCK
33 HSYNC
34 VSYNC
35 DE
36 Q23
37 Q22
38 Q21
39 Q20
40 VCC
41 GND
42 Q19
43 Q18
44 Q17
45 OGND
46 ODCK
47 OVCC
48 Q16
49 Q15
50 Q14
51 Q13
52 Q12
53 Q11
54 Q10
55 Q9
56 OVCC
57 OGND
58 Q8
59 Q7
60 Q6
61 Q5
62 Q4
63 Q3
64 VCC
65 GND
66 OGND
67 OVCC
68 Q2
69 Q1
70 Q0
71 INT
72 RESET#
73 RSVDL
74 CSCL
75 CSDA
76 DSDA
77 DSCL
78 OGND
79 PGND1
80 PVCC1
81 EXT_RES
82 AVCC
83 RXC-
84 RXC+
85 AGND
86 RX0-
87 RX0+
88 AGND
89 AVCC
90 AGND
91 RX1-
92 RX1+
93 AVCC
94 AGND
95 AVCC
96 RX2-
97 RX2+
98 AGND
99 GND
100 VCC

E_14620_149.eps
170305

Figure 9-11 Internal block diagram and pin configuration

10. Spare Parts List

Set Level

Various

0032	3122 137 23171	Power Supply Unit (32 inch)
0032	3122 137 23191	Power Supply Unit (26 inch)
8188	2422 070 98151	MAINSCORD EUR 1M5 BK B
8903	3104 311 09141	Cable 4P/560
8903	3139 131 05771	Cable 04P/280

—~—

5213	2422 264 00506	Loudsp. 8Ω 5W fullrange
5213	2422 264 00536	Loudsp. 5W fullrange

Small Signal Board [B]

Various

0601	3139 127 04122	Hercules SW (check Prod. Survey)
0611	3139 127 04112	Scaler SW (check Prod. Survey)
1101	2422 025 18749	Connector 3p m
1102	3139 147 19801	Tuner UV1318S/A IH -3
1104	2422 549 44372	SAW 38.9MHz K3953L
1106	2422 549 44369	SAW 38.9MHz K9656L
1107	2422 025 18749	Connector 3p m
1202	2422 543 01414	Xtal 24.576MHz
1801	2422 543 01133	Xtal 14.32MHz 20pF
1F00	2422 033 00515	Socket DVI-I 29p f
1F01	2422 026 05703	Socket 1P f
1G01	4822 265 10703	Socket scart 21p
1G02	4822 265 10703	Socket scart 21p
1J02	2422 025 10772	Connector 12p m
1J03	2422 025 10768	Connector 3p m
1J04	2422 025 10769	Connector 9p m
1K00	2422 025 08149	Connector 6p m
1K01	2422 025 10772	Connector 12p m
1K02	2422 025 10768	Connector 3p m
1K03	2422 025 14531	20p f
1N01	2422 025 17274	Connector 10p m
1N02	2422 025 18779	Connector 4P m
1N05	2722 171 08825	Xtal 14.31818Mhz 15pF
1P01	2422 549 45325	Bead 67Ω at 100MHz
1P02	2422 549 45325	Bead 67Ω at 100MHz
1P03	2422 549 45325	Bead 67Ω at 100MHz
1P04	2422 549 45325	Bead 67Ω at 100MHz
1P05	2422 549 45325	Bead 67Ω at 100MHz
1P06	2422 025 18772	Connector 30p m
8J02	3139 131 05901	Cable 12P/280/12P
8J03	3139 110 27651	Cable 03P/100/03P
8J04	3104 311 09251	Cable 9P/140/9P
8K01	3139 131 05901	Cable 12P/280/12P

⊣⊢

2101	4822 124 12095	100µF 20% 16V
2102	5322 126 11583	10nF 10% 50V 0603
2103	5322 126 11583	10nF 10% 50V 0603
2104	4822 122 33761	22pF 5% 50V
2105	4822 122 33761	22pF 5% 50V
2106	5322 126 11583	10nF 10% 50V 0603
2107	3198 024 44730	47nF 50V 0603
2109	5322 124 41945	22µF 20% 35V
2113	4822 124 12095	100µF 20% 16V
2203	4822 124 23002	10µF 16V
2206	2020 552 00035	2.2µF 6.3V 10% 0603
2207	2020 552 96718	220nF 10% 6.3V 0402
2208	4822 124 12084	1µF 20% 50V
2209	4822 124 23002	10µF 16V
2210	2020 552 96718	220nF 10% 6.3V 0402
2211	2020 552 96628	10nF 10% 16V 0402
2214	2020 552 96618	1nF 10% 50V 0402
2216	2020 552 96618	1nF 10% 50V 0402
2218	3198 035 71040	100nF 10% 16V 0402
2221	4822 124 12095	100µF 20% 16V
2223	2238 869 15101	100pF 5% 50V 0402
2225	2020 552 96618	1nF 10% 50V 0402
2226	3198 035 03320	3.3nF 5% 50V 0402
2227	2020 552 96618	1nF 10% 50V 0402
2228	3198 035 71040	100nF 10% 16V 0402
2230	3198 035 71040	100nF 10% 16V 0402
2231	2020 552 96718	220nF 10% 6.3V 0402
2232	3198 035 71040	100nF 10% 16V 0402
2233	4822 124 23002	10µF 16V
2234	2020 552 96718	220nF 10% 6.3V 0402
2235	2020 552 96718	220nF 10% 6.3V 0402
2236	4822 126 14076	220nF +80/-20% 25V
2237	2020 552 96718	220nF 10% 6.3V 0402
2238	2020 552 96718	220nF 10% 6.3V 0402
2239	3198 035 71040	100nF 10% 16V 0402
2240	2020 552 96718	220nF 10% 6.3V 0402
2241	2020 552 96718	220nF 10% 6.3V 0402
2242	3198 035 71040	100nF 10% 16V 0402
2243	4822 124 23002	10µF 16V
2244	3198 035 71040	100nF 10% 16V 0402
2245	3198 035 71040	100nF 10% 16V 0402
2246	3198 035 71040	100nF 10% 16V 0402
2250	2020 552 96618	1nF 10% 50V 0402
2251	2020 552 96656	10µF 20% 25V 1210
2252	3198 035 71040	100nF 10% 16V 0402
2253	3198 035 71040	100nF 10% 16V 0402
2254	3198 035 71040	100nF 10% 16V 0402
2255	3198 035 71040	100nF 10% 16V 0402
2256	4822 124 23002	10µF 16V
2257	3198 035 71040	100nF 10% 16V 0402
2258	2020 552 96637	10µF 10% 6.3V 0805
2259	3198 035 71040	100nF 10% 16V 0402
2260	2020 552 96637	10µF 10% 6.3V 0805
2262	4822 124 12082	10µF 20% 50V
2263	3198 035 26820	6.8nF 10% 16V 0402
2264	3198 017 44740	470nF 10V 0603
2265	3198 017 41050	1µF 10V 0603
2266	3198 035 71040	100nF 10% 16V 0402
2267	2020 552 96718	220nF 10% 6.3V 0402
2269	2020 012 00003	470µF 16V 20% SMD
2270	3198 035 71040	100nF 10% 16V 0402
2271	4822 124 12095	100µF 20% 16V
2272	3198 035 71040	100nF 10% 16V 0402
2273	2020 552 96718	220nF 10% 6.3V 0402
2274	3198 017 31540	150nF 10V 0603
2277	3198 035 71040	100nF 10% 16V 0402
2280	2020 552 00027	4.7µF 2% 6.3V 0603
2281	2020 552 00027	4.7µF 2% 6.3V 0603
2285	3198 035 71040	100nF 10% 16V 0402
2286	3198 035 71040	100nF 10% 16V 0402
2289	4822 051 30151	150Ω 5% 0.062W
2290	2222 240 59872	4.7µF 5% 10V 0805
2291	3198 035 71040	100nF 10% 16V 0402
2449	3198 035 71040	100nF 10% 16V 0402
2603	2020 552 96834	1µF 20% 6.3V 0402
2604	3198 035 04710	470pF 50V 0402
2605	2020 552 96834	1µF 20% 6.3V 0402
2608	2020 552 96834	1µF 20% 6.3V 0402
2609	3198 035 04710	470pF 50V 0402
2610	2020 552 96834	1µF 20% 6.3V 0402
2611	4822 124 12095	100µF 20% 16V
2613	3198 017 41050	1µF 10V 0603
2614	3198 035 71040	100nF 10% 16V 0402
2615	2020 012 00003	470µF 16V 20% SMD
2616	2020 552 00035	2.2µF 6.3V 10% 0603
2617	2020 552 00035	2.2µF 6.3V 10% 0603
2618	2020 012 00003	470µF 16V 20% SMD
2619	2020 552 96738	47µF 6.3V
2701	2238 869 15101	100pF 5% 50V 0402
2704	4822 124 23002	10µF 16V
2716	2020 012 00028	470µF 20% 16V
2730	2020 552 96656	10µF 20% 25V 1210
2731	2020 012 00003	470µF 16V 20% SMD
2733	3198 035 02210	220pF 5% 50V 0402
2734	2238 787 16641	22nF 10% 16V 0402
2735	3198 035 04710	470pF 50V 0402
2736	2022 031 00308	22µF 20% 35V
2737	2020 012 00003	470µF 16V 20% SMD
2738	4822 124 80151	47µF 16V
2739	4822 124 80151	47µF 16V
2750	2020 552 00035	2.2µF 6.3V 10% 0603
2751	3198 035 71040	100nF 10% 16V 0402
2752	4822 124 80151	47µF 16V
2753	2020 012 00003	470µF 16V 20% SMD
2755	3198 035 14720	4.7nF 5% 25V 0402
2756	3198 035 04710	470pF 50V 0402
2757	2020 012 00003	470µF 16V 20% SMD
2758	2020 012 00003	470µF 16V 20% SMD
2760	2020 552 96671	1µF 10% 25V
2800	2020 021 91557	100µF 20% 16V
2801	3198 035 71040	100nF 10% 16V 0402
2802	3198 035 71040	100nF 10% 16V 0402
2803	3198 035 71040	100nF 10% 16V 0402
2804	3198 035 71040	100nF 10% 16V 0402
2805	3198 035 71040	100nF 10% 16V 0402
2806	3198 035 71040	100nF 10% 16V 0402
2807	3198 035 71040	100nF 10% 16V 0402
2808	3198 035 71040	100nF 10% 16V 0402
2809	3198 035 71040	100nF 10% 16V 0402
2810	3198 035 71040	100nF 10% 16V 0402
2811	3198 035 71040	100nF 10% 16V 0402
2812	3198 035 71040	100nF 10% 16V 0402
2813	3198 035 71040	100nF 10% 16V 0402
2814	3198 035 71040	100nF 10% 16V 0402
2815	5322 124 41945	22µF 20% 35V
2816	3198 035 71040	100nF 10% 16V 0402
2817	3198 035 71040	100nF 10% 16V 0402
2818	3198 035 71040	100nF 10% 16V 0402
2819	3198 035 71040	100nF 10% 16V 0402
2820	3198 035 71040	100nF 10% 16V 0402
2821	3198 035 71040	100nF 10% 16V 0402
2822	3198 035 71040	100nF 10% 16V 0402
2823	4822 126 14519	22pF 5% 50V 0402
2824	4822 126 14519	22pF 5% 50V 0402
2900	3198 035 71040	100nF 10% 16V 0402
2901	2020 552 96618	1nF 10% 50V 0402
2902	2020 021 00046	470µF 20% 16V
2903	3198 035 71040	100nF 10% 16V 0402
2904	4822 124 80151	47µF 16V
2905	2020 021 91557	100µF 20% 16V
2906	3198 035 71040	100nF 10% 16V 0402
2907	3198 035 71040	100nF 10% 16V 0402
2908	3198 035 71040	100nF 10% 16V 0402
2909	3198 035 71040	100nF 10% 16V 0402
2910	3198 035 71040	100nF 10% 16V 0402
2911	3198 035 71040	100nF 10% 16V 0402
2912	3198 035 71040	100nF 10% 16V 0402
2913	3198 035 71040	100nF 10% 16V 0402
2914	3198 035 71040	100nF 10% 16V 0402
2915	3198 035 71040	100nF 10% 16V 0402
2916	3198 035 71040	100nF 10% 16V 0402
2917	2020 021 91557	100µF 20% 16V
2918	3198 035 71040	100nF 10% 16V 0402
2919	3198 035 71040	100nF 10% 16V 0402
2920	3198 035 71040	100nF 10% 16V 0402
2921	3198 035 71040	100nF 10% 16V 0402
2922	3198 035 71040	100nF 10% 16V 0402
2923	3198 035 71040	100nF 10% 16V 0402
2924	3198 035 71040	100nF 10% 16V 0402
2925	3198 035 71040	100nF 10% 16V 0402
2926	3198 035 71040	100nF 10% 16V 0402
2927	3198 035 71040	100nF 10% 16V 0402
2928	3198 035 71040	100nF 10% 16V 0402
2929	3198 035 71040	100nF 10% 16V 0402
2930	3198 035 71040	100nF 10% 16V 0402
2931	3198 035 71040	100nF 10% 16V 0402
2932	3198 035 71040	100nF 10% 16V 0402
2933	3198 035 71040	100nF 10% 16V 0402
2934	4822 124 80151	47µF 16V
2935	3198 035 71040	100nF 10% 16V 0402
2936	3198 035 71040	100nF 10% 16V 0402
2937	3198 035 71040	100nF 10% 16V 0402
2938	3198 035 71040	100nF 10% 16V 0402
2939	3198 035 71040	100nF 10% 16V 0402
2940	4822 124 80151	47µF 16V
2941	3198 035 71040	100nF 10% 16V 0402
2942	3198 035 71040	100nF 10% 16V 0402
2945	5322 124 41945	22µF 20% 35V
2946	3198 035 71040	100nF 10% 16V 0402
2947	3198 035 71040	100nF 10% 16V 0402
2948	3198 035 71040	100nF 10% 16V 0402
2949	3198 035 71040	100nF 10% 16V 0402
2950	5322 124 41945	22µF 20% 35V
2951	3198 035 71040	100nF 10% 16V 0402
2952	3198 035 71040	100nF 10% 16V 0402
2953	3198 035 71040	100nF 10% 16V 0402
2954	3198 035 71040	100nF 10% 16V 0402
2955	5322 124 41945	22µF 20% 35V
2956	3198 035 71040	100nF 10% 16V 0402
2957	3198 035 71040	100nF 10% 16V 0402
2958	3198 035 71040	100nF 10% 16V 0402
2959	3198 035 71040	100nF 10% 16V 0402
2B01	4822 124 80151	47µF 16V
2B02	4822 124 11131	47µF 6.3V
2B03	3198 035 71040	100nF 10% 16V 0402
2B04	3198 035 71040	100nF 10% 16V 0402
2B05	3198 035 71040	100nF 10% 16V 0402
2B06	3198 035 71040	100nF 10% 16V 0402
2B07	3198 035 71040	100nF 10% 16V 0402
2B08	3198 035 71040	100nF 10% 16V 0402
2B09	3198 035 71040	100nF 10% 16V 0402
2B10	3198 035 71040	100nF 10% 16V 0402
2B11	3198 035 71040	100nF 10% 16V 0402
2B12	3198 035 71040	100nF 10% 16V 0402
2B13	3198 035 71040	100nF 10% 16V 0402
2B14	3198 035 71040	100nF 10% 16V 0402
2B15	3198 035 71040	100nF 10% 16V 0402
2B16	3198 035 71040	100nF 10% 16V 0402
2B17	3198 035 71040	100nF 10% 16V 0402
2B18	5322 124 41945	22µF 20% 35V
2C00	3198 035 71040	100nF 10% 16V 0402
2C01	4822 124 23002	10µF 16V
2C02	3198 035 71040	100nF 10% 16V 0402
2C03	3198 035 71040	100nF 10% 16V 0402
2E00	2020 552 00005	4.7µF 10% 6.3V 0603
2E01	2020 552 00005	4.7µF 10% 6.3V 0603
2E02	2020 552 00005	4.7µF 10% 6.3V 0603
2E03	3198 035 71040	100nF 10% 16V 0402
2E04	2020 552 96834	1µF 20% 6.3V 0402
2E05	2020 552 96834	1µF 20% 6.3V 0402
2E06	2020 552 96834	1µF 20% 6.3V 0402
2E07	4822 126 14324	33pF 5% 50V 0402
2E08	2020 552 00005	4.7µF 10% 6.3V 0603
2E09	4822 126 14324	33pF 5% 50V 0402
2E10	2020 552 00005	4.7µF 10% 6.3V 0603
2E11	4822 126 14324	33pF 5% 50V 0402
2E12	2020 552 00005	4.7µF 10% 6.3V 0603
2E13	3198 017 41050	1µF 10V 0603
2E14	4822 126 14324	33pF 5% 50V 0402
2E15	3198 035 71040	100nF 10% 16V 0402
2E16	3198 035 71040	100nF 10% 16V 0402
2E17	3198 035 71040	100nF 10% 16V 0402
2E18	3198 035 71040	100nF 10% 16V 0402
2E19	3198 035 71040	100nF 10% 16V 0402
2E20	4822 124 11131	47µF 6.3V
2E21	2020 552 00005	4.7µF 10% 6.3V 0603
2E22	2020 552 00005	4.7µF 10% 6.3V 0603
2E23	2020 552 00005	4.7µF 10% 6.3V 0603
2E24	3198 035 71040	100nF 10% 16V 0402
2E25	3198 035 71040	100nF 10% 16V 0402
2E26	3198 035 71040	100nF 10% 16V 0402
2E27	3198 035 71040	100nF 10% 16V 0402
2E28	3198 035 71040	100nF 10% 16V 0402
2E29	3198 035 71040	100nF 10% 16V 0402
2E30	3198 035 71040	100nF 10% 16V 0402
2E31	3198 035 71040	100nF 10% 16V 0402
2E32	3198 035 71040	100nF 10% 16V 0402
2E33	2020 552 00005	4.7µF 10% 6.3V 0603
2E34	2020 552 00005	4.7µF 10% 6.3V 0603
2E35	2020 552 00005	4.7µF 10% 6.3V 0603
2E36	3198 035 71040	100nF 10% 16V 0402
2F04	2020 552 94427	100pF 5% 50V
2F07	2238 586 59812	100nF 20% 50V 0603
2F08	4822 126 14241	330pF 0603 50V
2F09	4822 126 14241	330pF 0603 50V
2F10	2020 552 94427	100pF 5% 50V
2F11	4822 126 14241	330pF 0603 50V
2F12	4822 126 14241	330pF 0603 50V
2F13	4822 126 14508	180pF 5% 50V 0603
2F14	4822 126 14508	180pF 5% 50V 0603
2F15	2020 552 00035	2.2µF 6.3V 10% 0603
2F16	2020 552 00035	2.2µF 6.3V 10% 0603
2G05	4822 126 14241	330pF 0603 50V
2G06	4822 126 14508	180pF 5% 50V 0603
2G07	4822 124 23002	10µF 16V
2G08	2020 552 00035	2.2µF 6.3V 10% 0603
2G09	4822 126 14241	330pF 0603 50V
2G10	4822 126 14508	180pF 5% 50V 0603
2G11	4822 124 23002	10µF 16V
2G12	2020 552 00035	2.2µF 6.3V 10% 0603
2G18	4822 126 14241	330pF 0603 50V
2G19	4822 126 14508	180pF 5% 50V 0603
2G20	4822 124 23002	10µF 16V
2G21	2020 552 00035	2.2µF 6.3V 10% 0603
2G22	4822 126 14241	330pF 0603 50V
2G23	4822 126 14508	180pF 5% 50V 0603
2G24	4822 124 23002	10µF 16V
2G25	2020 552 00035	2.2µF 6.3V 10% 0603
2G26	2020 552 00005	4.7µF 10% 6.3V 0603
2G28	2020 552 00005	4.7µF 10% 6.3V 0603
2G47	2238 586 59812	100nF 20% 50V 0603
2G55	2020 552 00005	4.7µF 10% 6.3V 0603
2G56	2020 552 00005	4.7µF 10% 6.3V 0603
2J02	2020 552 96618	1nF 10% 50V 0402
2J03	2020 552 96618	1nF 10% 50V 0402
2J17	2238 869 15101	100pF 5% 50V 0402
2J18	2238 869 15101	100pF 5% 50V 0402
2J19	2238 869 15101	100pF 5% 50V 0402
2J21	2238 869 15101	100pF 5% 50V 0402
2J22	2238 869 15101	100pF 5% 50V 0402
2J23	2238 869 15101	100pF 5% 50V 0402
2J26	2238 869 15101	100pF 5% 50V 0402
2J27	2238 869 15101	100pF 5% 50V 0402
2J28	2238 869 15101	100pF 5% 50V 0402
2J29	2238 869 15101	100pF 5% 50V 0402
2J30	2020 552 96618	1nF 10% 50V 0402
2J35	2020 552 96618	1nF 10% 50V 0402
2K00	2020 552 96618	1nF 10% 50V 0402
2K01	2020 552 96618	1nF 10% 50V 0402
2K02	2238 869 15109	10pF 5% 50V 0402
2K03	2238 869 15109	10pF 5% 50V 0402
2K04	2238 869 15109	10pF 5% 50V 0402
2K05	2238 869 15109	10pF 5% 50V 0402
2K06	2238 869 15101	100pF 5% 50V 0402
2K07	2238 869 15101	100pF 5% 50V 0402
2K08	2020 552 00035	2.2µF 6.3V 10% 0603
2K10	2238 869 15101	100pF 5% 50V 0402
2K11	2238 869 15101	100pF 5% 50V 0402
2K12	2020 552 00035	2.2µF 6.3V 10% 0603
2K13	2238 869 15101	100pF 5% 50V 0402
2K14	2238 869 15101	100pF 5% 50V 0402
2K15	2238 869 15101	100pF 5% 50V 0402
2K16	2238 869 15101	100pF 5% 50V 0402
2K17	2238 869 15101	100pF 5% 50V 0402
2K18	2238 869 15101	100pF 5% 50V 0402
2K19	2020 552 96618	1nF 10% 50V 0402
2K20	2020 552 96618	1nF 10% 50V 0402
2K21	2238 869 15101	100pF 5% 50V 0402
2K22	2238 869 15101	100pF 5% 50V 0402
2K23	2238 869 15101	100pF 5% 50V 0402
2K24	2238 869 15101	100pF 5% 50V 0402
2K25	2238 869 15101	100pF 5% 50V 0402
2K26	2238 869 15101	100pF 5% 50V 0402
2K27	2238 869 15101	100pF 5% 50V 0402
2K28	2238 869 15101	100pF 5% 50V 0402
2L02	2020 552 96637	10µF 10% 6.3V 0805
2L03	3198 035 71040	100nF 10% 16V 0402
2L04	3198 035 71040	100nF 10% 16V 0402
2L05	3198 035 71040	100nF 10% 16V 0402
2L06	3198 035 71040	100nF 10% 16V 0402
2L07	2020 552 96637	10µF 10% 6.3V 0805
2L08	3198 035 71040	100nF 10% 16V 0402
2L09	3198 035 71040	100nF 10% 16V 0402
2L10	3198 035 71040	100nF 10% 16V 0402
2L11	3198 035 71040	100nF 10% 16V 0402
2L13	3198 035 74730	47nF 5% 16V 0402
2L17	3198 035 74730	47nF 5% 16V 0402
2L20	3198 035 71040	100nF 10% 16V 0402
2L21	3198 035 71040	100nF 10% 16V 0402
2L22	2020 552 96637	10µF 10% 6.3V 0805
2L23	3198 035 71040	100nF 10% 16V 0402
2L24	3198 035 71040	100nF 10% 16V 0402
2L26	2020 552 96718	220nF 10% 6.3V 0402
2L27	4822 124 23002	10µF 16V
2L28	4822 124 23002	10µF 16V
2L29	4822 124 23002	10µF 16V
2L30	4822 124 23002	10µF 16V
2L31	4822 124 12095	100µF 20% 16V
2L32	4822 124 12095	100µF 20% 16V
2L33	3198 035 71040	100nF 10% 16V 0402
2L34	3198 035 71040	100nF 10% 16V 0402
2L37	4822 126 14524	68pF 5% 50V 0402
2L39	2238 869 15829	82pF 5% 50V 0402
2M00	3198 035 71040	100nF 10% 16V 0402
2M01	3198 035 71040	100nF 10% 16V 0402
2M02	3198 035 71040	100nF 10% 16V 0402
2M03	3198 035 71040	100nF 10% 16V 0402
2M04	3198 035 71040	100nF 10% 16V 0402
2M05	3198 035 71040	100nF 10% 16V 0402
2M06	3198 035 71040	100nF 10% 16V 0402
2M07	3198 035 71040	100nF 10% 16V 0402
2M08	3198 035 71040	100nF 10% 16V 0402
2M09	3198 035 71040	100nF 10% 16V 0402
2M10	3198 035 71040	100nF 10% 16V 0402
2M11	3198 035 71040	100nF 10% 16V 0402
2M12	3198 035 71040	100nF 10% 16V 0402
2M13	3198 035 71040	100nF 10% 16V 0402
2M14	3198 035 71040	100nF 10% 16V 0402
2M15	3198 035 71040	100nF 10% 16V 0402
2M16	3198 035 71040	100nF 10% 16V 0402
2M17	3198 035 71040	100nF 10% 16V 0402
2M18	3198 035 71040	100nF 10% 16V 0402
2M19	3198 035 71040	100nF 10% 16V 0402
2M20	3198 035 71040	100nF 10% 16V 0402
2M21	2020 552 00035	2.2µF 6.3V 10% 0603
2M22	3198 035 71040	100nF 10% 16V 0402
2M23	4822 124 12095	100µF 20% 16V
2M24	3198 035 71040	100nF 10% 16V 0402
2M25	3198 035 71040	100nF 10% 16V 0402
2M26	3198 035 71040	100nF 10% 16V 0402
2M27	3198 035 71040	100nF 10% 16V 0402
2M28	3198 035 71040	100nF 10% 16V 0402
2M29	3198 035 71040	100nF 10% 16V 0402
2M30	3198 035 71040	100nF 10% 16V 0402
2M31	4822 124 12095	100µF 20% 16V
2M32	4822 124 12095	100µF 20% 16V
2M56	4822 124 12095	100µF 20% 16V
2M65	3198 035 71040	100nF 10% 16V 0402
2M66	4822 124 12095	100µF 20% 16V
2M67	3198 035 71040	100nF 10% 16V 0402
2M68	4822 124 12095	100µF 20% 16V
2N01	3198 035 71040	100nF 10% 16V 0402
2N02	3198 035 71040	100nF 10% 16V 0402
2N03	2020 552 96834	1µF 20% 6.3V 0402
2N04	2020 552 96618	1nF 10% 50V 0402
2N05	3198 035 71040	100nF 10% 16V 0402
2N06	3198 035 71040	100nF 10% 16V 0402
2N07	3198 035 71040	100nF 10% 16V 0402
2N08	3198 035 71040	100nF 10% 16V 0402
2N09	3198 035 71040	100nF 10% 16V 0402
2N10	3198 035 71040	100nF 10% 16V 0402
2N11	2238 869 15101	100pF 5% 50V 0402
2N12	2238 869 15101	100pF 5% 50V 0402
2N13	2238 869 15101	100pF 5% 50V 0402
2N14	2238 869 15101	100pF 5% 50V 0402
2N15	2238 869 15101	100pF 5% 50V 0402
2N16	2238 869 15101	100pF 5% 50V 0402
2P01	2020 552 00035	2.2µF 6.3V 10% 0603
2P02	3198 035 71040	100nF 10% 16V 0402
2P03	3198 035 71040	100nF 10% 16V 0402
2P04	3198 035 71040	100nF 10% 16V 0402
2P05	3198 035 71040	100nF 10% 16V 0402
2P06	3198 035 71040	100nF 10% 16V 0402
2P07	3198 035 71040	100nF 10% 16V 0402
2P08	3198 035 71040	100nF 10% 16V 0402
2P09	3198 035 71040	100nF 10% 16V 0402
2P10	3198 035 71040	100nF 10% 16V 0402
2P11	3198 035 71040	100nF 10% 16V 0402
2P12	3198 035 71040	100nF 10% 16V 0402
2P13	3198 035 71040	100nF 10% 16V 0402
2P14	3198 035 71040	100nF 10% 16V 0402
2P15	4822 124 12095	100µF 20% 16V
2P16	3198 035 71040	100nF 10% 16V 0402
2P17	2020 552 00035	2.2µF 6.3V 10% 0603
2P18	2020 552 00035	2.2µF 6.3V 10% 0603
2P19	3198 035 71040	100nF 10% 16V 0402
2P20	3198 035 71040	100nF 10% 16V 0402
2P21	3198 035 71040	100nF 10% 16V 0402
2P22	2020 552 00035	2.2µF 6.3V 10% 0603
2P23	3198 035 71040	100nF 10% 16V 0402
2P24	3198 035 71040	100nF 10% 16V 0402
2P25	3198 035 71040	100nF 10% 16V 0402
2P26	3198 035 71040	100nF 10% 16V 0402
2P27	3198 035 71040	100nF 10% 16V 0402
2P28	3198 035 71040	100nF 10% 16V 0402
2P29	3198 035 71040	100nF 10% 16V 0402
2P30	3198 035 71040	100nF 10% 16V 0402
2P31	3198 035 71040	100nF 10% 16V 0402
2P32	3198 035 71040	100nF 10% 16V 0402
2P33	3198 035 71040	100nF 10% 16V 0402
2P34	3198 035 71040	100nF 10% 16V 0402
2P35	3198 035 71040	100nF 10% 16V 0402
2P36	2238 869 15109	10pF 5% 50V 0402
2P37	2238 869 15109	10pF 5% 50V 0402
2P38	2238 869 15109	10pF 5% 50V 0402
2P39	2238 869 15109	10pF 5% 50V 0402
2P40	2238 869 15109	10pF 5% 50V 0402
2P41	2238 869 15109	10pF 5% 50V 0402
2P42	2238 869 15109	10pF 5% 50V 0402
2P43	2238 869 15109	10pF 5% 50V 0402
2P44	2238 869 15109	10pF 5% 50V 0402
2P45	2238 869 15109	10pF 5% 50V 0402

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3103	4822 117 13606	10kΩ 5% 0.01W 0402
3104	4822 051 30103	10kΩ 5% 0.062W
3105	4822 117 13548	1kΩ 5% 0402
3107	4822 051 30682	6.8Ω 5% 0.062W
3108	4822 051 30222	2.2kΩ 5% 0.062W
3109	4822 051 30222	2.2kΩ 5% 0.062W
3111	4822 051 30223	22kΩ 5% 0.062W
3112	4822 051 30183	18kΩ 5% 0.062W
3120	4822 117 13606	10kΩ 5% 0.01W 0402
3121	4822 117 13606	10kΩ 5% 0.01W 0402
3122	4822 117 13545	100Ω 1% 0402
3123	4822 117 13545	100Ω 1% 0402
3124	4822 117 13545	100Ω 1% 0402
3125	4822 117 13545	100Ω 1% 0402
3207	3198 031 06810	680Ω 5% 0.01W 0402
3208	4822 117 13545	100Ω 1% 0402
3209	4822 117 13545	100Ω 1% 0402
3210	4822 117 13545	100Ω 1% 0402
3211	4822 117 13545	100Ω 1% 0402
3212	4822 117 13545	100Ω 1% 0402
3213	4822 117 13545	100Ω 1% 0402
3214	3198 031 06810	680Ω 5% 0.01W 0402
3215	3198 031 02710	270Ω 5% 0.1W 0402
3216	4822 117 13597	330Ω 5% 0402 0.01W
3217	4822 117 13548	1kΩ 5% 0402
3218	4822 117 11297	100kΩ 5% 0.1W
3219	4822 117 13545	100Ω 1% 0402
3220	3198 031 04730	47Ω 5% 0402
3222	4822 117 13545	100Ω 1% 0402
3223	3198 031 01090	10Ω 5% 0.01W 0402

3224	3198 031 04720	4.7kΩ 5% 0402
3225	3198 031 04720	4.7kΩ 5% 0402
3226	4822 117 13545	100Ω 1% 0402
3227	4822 117 13545	100Ω 1% 0402
3229	3198 031 04720	4.7kΩ 5% 0402
3230	4822 117 13606	10kΩ 5% 0.01W 0402
3231	4822 117 13602	2.2kΩ 5% 0.01W 0402
3232	3198 031 03320	3.3kΩ 5% 0402
3233	3198 031 03320	3.3kΩ 5% 0402
3234	3198 031 04720	4.7kΩ 5% 0402
3235	3198 031 04720	4.7kΩ 5% 0402
3236	3198 031 04720	4.7kΩ 5% 0402
3238	4822 117 13545	100Ω 1% 0402
3239	4822 117 13545	100Ω 1% 0402
3240	2322 704 61002	1kΩ 1%
3241	4822 117 13545	100Ω 1% 0402
3242	4822 117 13606	10kΩ 5% 0.01W 0402
3243	3198 031 04720	4.7kΩ 5% 0402
3245	3198 031 02240	220kΩ 5% 0.1W 0402
3246	3198 031 04720	4.7kΩ 5% 0402
3247	4822 117 13545	100Ω 1% 0402
3248	4822 117 13545	100Ω 1% 0402
3249	3198 031 04720	4.7kΩ 5% 0402
3250	4822 117 13545	100Ω 1% 0402
3251	4822 117 13545	100Ω 1% 0402
3252	4822 117 13545	100Ω 1% 0402
3253	4822 117 13545	100Ω 1% 0402
3255	4822 117 13605	Jumper 0402
3256	4822 117 13605	Jumper 0402
3257	4822 117 13605	Jumper 0402
3258	4822 117 13548	1kΩ 5% 0402
3259	4822 117 13548	1kΩ 5% 0402
3260	4822 117 13548	1kΩ 5% 0402
3262	4822 117 13601	22kΩ 5% 0402
3263	2322 702 70398	3.9Ω 5% 0603
3264	4822 117 13601	22kΩ 5% 0402
3265	2322 702 70398	3.9Ω 5% 0603
3266	3198 031 05620	5.6kΩ 5% 0.01W 0402
3267	3198 031 05620	5.6kΩ 5% 0.01W 0402
3268	4822 117 13545	100Ω 1% 0402
3272	3198 031 04720	4.7kΩ 5% 0402
3273	4822 117 13548	1kΩ 5% 0402
3274	3198 031 03910	390Ω 1% 0402
3275	4822 117 13545	100Ω 1% 0402
3276	3198 031 07590	75Ω 5% 0402
3277	3198 031 01520	1.2kΩ 5% 0.01W 0402
3280	4822 117 11151	1Ω 5%
3281	3198 031 03930	39kΩ 5% 0402
3285	4822 117 13605	Jumper 0402
3286	4822 117 13545	100Ω 1% 0402
3292	3198 031 01230	12kΩ 5% 0402
3294	3198 031 04730	47Ω 5% 0402
3295	4822 117 11297	100kΩ 5% 0.1W
3431	4822 117 13548	1kΩ 5% 0402
3451	3198 031 04720	4.7kΩ 5% 0402
3453	4822 117 13545	100Ω 1% 0402
3454	4822 117 13545	100Ω 1% 0402
3455	4822 117 13545	100Ω 1% 0402
3456	4822 117 13545	100Ω 1% 0402
3458	4822 117 13545	100Ω 1% 0402
3459	4822 117 13545	100Ω 1% 0402
3461	4822 117 13545	100Ω 1% 0402
3462	4822 117 13545	100Ω 1% 0402
3604	4822 117 13601	22kΩ 5% 0402
3605	4822 117 13601	22kΩ 5% 0402
3609	4822 117 13601	22kΩ 5% 0402
3610	4822 117 11297	100kΩ 5% 0.1W
3611	4822 117 11297	100kΩ 5% 0.1W
3612	4822 117 13601	22kΩ 5% 0402
3615	4822 117 13606	10kΩ 5% 0.01W 0402
3618	4822 117 13601	22kΩ 5% 0402
3623	3198 031 04730	47Ω 5% 0402
3625	3198 031 03320	3.3kΩ 5% 0402
3627	4822 117 13601	22kΩ 5% 0402
3630	4822 117 13597	330Ω 5% 0402 0.01W
3631	4822 117 13597	330Ω 5% 0402 0.01W
3732	2322 704 61002	1kΩ 1%
3733	2322 704 63302	3.3kΩ 1% 0603
3734	4822 117 13602	2.2kΩ 5% 0.01W 0402
3735	4822 117 13548	1kΩ 5% 0402
3736	3198 031 04720	4.7kΩ 5% 0402
3750	4822 117 13601	22kΩ 5% 0402
3751	3198 021 31080	1Ω 5% 0603
3752	3198 021 31080	1Ω 5% 0603
3753	2322 704 61002	1kΩ 1%
3754	2322 704 63302	3.3kΩ 1% 0603
3755	4822 117 13606	10kΩ 5% 0.01W 0402
3758	3198 031 01530	15kΩ 5% 0.01W 0402
3759	3198 031 01230	12kΩ 5% 0402
3760	4822 117 13545	100Ω 1% 0402
3800	4822 117 13606	10kΩ 5% 0.01W 0402
3801	2350 035 10229	4 x 22Ω 5% 1206
3802	2350 035 10229	4 x 22Ω 5% 1206
3803	2350 035 10229	4 x 22Ω 5% 1206

3804	2350 035 10229	4 x 22Ω 5% 1206
3805	2350 035 10229	4 x 22Ω 5% 1206
3806	2350 035 10229	4 x 22Ω 5% 1206
3807	2350 035 10229	4 x 22Ω 5% 1206
3808	2350 035 10229	4 x 22Ω 5% 1206
3809	2350 035 10229	4 x 22Ω 5% 1206
3810	2350 035 10229	4 x 22Ω 5% 1206
3811	2350 035 10229	4 x 22Ω 5% 1206
3812	2350 035 10229	4 x 22Ω 5% 1206
3813	2350 035 10229	4 x 22Ω 5% 1206
3814	3198 031 02290	22Ω 5% 0.1W 0402
3815	3198 031 02290	22Ω 5% 0.1W 0402
3816	3198 031 02290	22Ω 5% 0.1W 0402
3817	4822 117 13606	10kΩ 5% 0.01W 0402
3818	4822 117 13606	10kΩ 5% 0.01W 0402
3820	4822 117 13606	10kΩ 5% 0.01W 0402
3822	4822 117 13545	100Ω 1% 0402
3824	3198 031 03320	3.3kΩ 5% 0402
3825	3198 031 11030	4 x 10kΩ 5% 1206
3826	3198 031 11030	4 x 10kΩ 5% 1206
3827	4822 117 13606	10kΩ 5% 0.01W 0402
3828	4822 117 13606	10kΩ 5% 0.01W 0402
3829	4822 117 13606	10kΩ 5% 0.01W 0402
3831	4822 117 13545	100Ω 1% 0402
3832	4822 117 13545	100Ω 1% 0402
3833	3198 031 01090	10Ω 5% 0.01W 0402
3834	4822 117 13606	10kΩ 5% 0.01W 0402
3835	4822 117 13606	10kΩ 5% 0.01W 0402
3836	4822 117 13606	10kΩ 5% 0.01W 0402
3837	4822 117 13606	10kΩ 5% 0.01W 0402
3838	4822 117 13606	10kΩ 5% 0.01W 0402
3839	4822 117 13545	100Ω 1% 0402
3840	3198 031 02290	22Ω 5% 0.1W 0402
3841	4822 117 13606	10kΩ 5% 0.01W 0402
3900	3198 031 03320	3.3kΩ 5% 0402
3901	4822 117 13606	10kΩ 5% 0.01W 0402
3902	4822 117 13606	10kΩ 5% 0.01W 0402
3903	4822 117 13545	100Ω 1% 0402
3904	4822 117 13545	100Ω 1% 0402
3A02	4822 117 13548	1kΩ 5% 0402
3B01	4822 117 12706	10kΩ 1% 0.063W 0603
3B02	4822 117 12706	10kΩ 1% 0.063W 0603
3B03	2322 704 61501	150Ω 1% 0603
3C00	4822 117 13606	10kΩ 5% 0.01W 0402
3C01	4822 117 13606	10kΩ 5% 0.01W 0402
3C02	4822 117 13548	1kΩ 5% 0402
3C04	3198 031 11030	4 x 10kΩ 5% 1206
3C05	4822 117 13606	10kΩ 5% 0.01W 0402
3C06	3198 031 11030	4 x 10kΩ 5% 1206
3C07	3198 031 11030	4 x 10kΩ 5% 1206
3C08	3198 031 11030	4 x 10kΩ 5% 1206
3C09	3198 031 11030	4 x 10kΩ 5% 1206
3C10	3198 031 11030	4 x 10kΩ 5% 1206
3C16	3198 031 11030	4 x 10kΩ 5% 1206
3C17	4822 117 13606	10kΩ 5% 0.01W 0402
3C18	4822 117 13606	10kΩ 5% 0.01W 0402
3E00	2322 705 70569	56Ω 5% 0402
3E01	2322 705 70569	56Ω 5% 0402
3E02	2322 705 70569	56Ω 5% 0402
3E06	3198 031 04730	47Ω 5% 0402
3E07	3198 031 04730	47Ω 5% 0402
3E08	3198 031 04730	47Ω 5% 0402
3E09	3198 031 04730	47Ω 5% 0402
3E10	3198 031 04730	47Ω 5% 0402
3E11	3198 031 04730	47Ω 5% 0402
3E12	4822 117 13606	10kΩ 5% 0.01W 0402
3E13	4822 117 13597	330Ω 5% 0402 0.01W
3E14	4822 117 13597	330Ω 5% 0402 0.01W
3E15	4822 117 13597	330Ω 5% 0402 0.01W
3E16	4822 117 13597	330Ω 5% 0402 0.01W
3E17	4822 117 13597	330Ω 5% 0402 0.01W
3E18	4822 117 13597	330Ω 5% 0402 0.01W
3E19	2322 705 70569	56Ω 5% 0402
3E20	2322 705 70569	56Ω 5% 0402
3E21	2322 705 70569	56Ω 5% 0402
3E22	4822 117 13632	100kΩ 1% 0603 0.62W
3E23	3198 031 08210	820Ω 5% 0.5W
3E24	4822 117 13543	470Ω 5% 0402
3E25	2322 705 70399	39Ω 5% 0402
3E26	3198 031 02290	22Ω 5% 0.1W 0402
3E27	2322 705 70399	39Ω 5% 0402
3E28	3198 031 02290	22Ω 5% 0.1W 0402
3E29	2322 705 70399	39Ω 5% 0402
3E30	3198 031 02290	22Ω 5% 0.1W 0402
3E31	4822 117 13545	100Ω 1% 0402
3E32	4822 117 13545	100Ω 1% 0402
3E33	4822 117 13545	100Ω 1% 0402
3E34	4822 117 13545	100Ω 1% 0402
3E35	4822 117 13545	100Ω 1% 0402
3E36	4822 117 13545	100Ω 1% 0402
3E37	3198 031 02290	22Ω 5% 0.1W 0402
3E38	4822 117 13545	100Ω 1% 0402
3E39	4822 117 13545	100Ω 1% 0402
3E41	4822 117 13545	100Ω 1% 0402

3E42	4822 117 13545	100Ω 1% 0402
3E43	4822 117 13545	100Ω 1% 0402
3E44	4822 117 13545	100Ω 1% 0402
3E45	4822 117 13545	100Ω 1% 0402
3E49	3198 031 02290	22Ω 5% 0.1W 0402
3E50	3198 031 04730	47Ω 5% 0402
3E51	3198 031 04730	47Ω 5% 0402
3E52	3198 031 04730	47Ω 5% 0402
3E53	3198 031 04730	47Ω 5% 0402
3E54	3198 031 04730	47Ω 5% 0402
3E55	3198 031 04730	47Ω 5% 0402
3F00	4822 051 30759	75Ω 5% 0.062W
3F09	4822 051 30759	75Ω 5% 0.062W
3F10	3198 021 31080	1Ω 5% 0603
3F11	4822 051 30759	75Ω 5% 0.062W
3F16	4822 051 30103	10kΩ 5% 0.062W
3F17	4822 051 30103	10kΩ 5% 0.062W
3F18	4822 051 30103	10kΩ 5% 0.062W
3F19	3198 021 31080	1Ω 5% 0603
3F20	4822 051 30101	100Ω 5% 0.062W
3F21	4822 051 30102	1kΩ 5% 0.062W
3F22	4822 051 30103	10kΩ 5% 0.062W
3F23	4822 051 30102	1kΩ 5% 0.062W
3F24	4822 051 30103	10kΩ 5% 0.062W
3F25	4822 051 30103	10kΩ 5% 0.062W
3F26	4822 051 30153	15kΩ 5% 0.062W
3F27	4822 051 30153	15kΩ 5% 0.062W
3F28	4822 051 30101	100Ω 5% 0.062W
3F29	4822 051 30101	100Ω 5% 0.062W
3G00	4822 051 30151	150Ω 5% 0.062W
3G01	4822 051 30103	10kΩ 5% 0.062W
3G02	4822 117 12891	220kΩ 1%
3G03	4822 051 30153	15kΩ 5% 0.062W
3G04	4822 051 30151	150Ω 5% 0.062W
3G05	4822 051 30103	10kΩ 5% 0.062W
3G06	4822 117 12891	220kΩ 1%
3G07	4822 051 30153	15kΩ 5% 0.062W
3G08	4822 051 30151	150Ω 5% 0.062W
3G12	2122 118 06408	91Ω 5% 0603
3G13	2122 118 06408	91Ω 5% 0603
3G14	2122 118 06408	91Ω 5% 0603
3G15	4822 051 30101	100Ω 5% 0.062W
3G16	4822 051 30101	100Ω 5% 0.062W
3G17	4822 051 30101	100Ω 5% 0.062W
3G26	4822 051 30273	27kΩ 5% 0.062W
3G27	4822 051 30682	6.8Ω 5% 0.062W
3G28	4822 051 30759	75Ω 5% 0.062W
3G29	4822 051 30331	330Ω 5% 0.062W
3G30	4822 051 30689	68Ω 5% 0.063W 0603
3G31	4822 051 30759	75Ω 5% 0.062W
3G32	4822 051 30102	1kΩ 5% 0.062W
3G33	4822 051 30101	100Ω 5% 0.062W
3G34	4822 051 30102	1kΩ 5% 0.062W
3G37	4822 051 30151	150Ω 5% 0.062W
3G38	4822 051 30103	10kΩ 5% 0.062W
3G39	4822 117 12891	220kΩ 1%
3G40	4822 051 30153	15kΩ 5% 0.062W
3G41	4822 051 30151	150Ω 5% 0.062W
3G42	4822 051 30103	10kΩ 5% 0.062W
3G43	4822 117 12891	220kΩ 1%
3G44	4822 051 30153	15kΩ 5% 0.062W
3G45	4822 051 30759	75Ω 5% 0.062W
3G46	4822 051 30101	100Ω 5% 0.062W
3G47	4822 117 12925	47kΩ 1% 0.063W 0603
3G48	4822 117 12925	47kΩ 1% 0.063W 0603
3G51	4822 051 30273	27kΩ 5% 0.062W
3G52	4822 051 30682	6.8Ω 5% 0.062W
3G53	4822 051 30689	68Ω 5% 0.063W 0603
3G54	4822 051 30102	1kΩ 5% 0.062W
3G57	4822 051 30759	75Ω 5% 0.062W
3G58	4822 051 30101	100Ω 5% 0.062W
3G59	4822 117 12925	47kΩ 1% 0.063W 0603
3G60	4822 117 12925	47kΩ 1% 0.063W 0603
3G96	4822 117 12925	47kΩ 1% 0.063W 0603
3G99	4822 117 12925	47kΩ 1% 0.063W 0603
3J03	3198 031 06890	68Ω 5% 0402
3J04	3198 031 06890	68Ω 5% 0402
3J05	3198 031 06890	68Ω 5% 0402
3K00	4822 117 13545	100Ω 1% 0402
3K01	4822 117 13545	100Ω 1% 0402
3K02	4822 117 13606	10kΩ 5% 0.01W 0402
3K03	3198 031 01530	15kΩ 5% 0.01W 0402
3K05	4822 117 13606	10kΩ 5% 0.01W 0402
3K06	3198 031 01530	15kΩ 5% 0.01W 0402
3K07	2322 705 70399	39Ω 5% 0402
3K08	3198 031 06890	68Ω 5% 0402
3K09	2322 705 70399	39Ω 5% 0402
3K11	3198 031 06890	68Ω 5% 0402
3K12	3198 031 06890	68Ω 5% 0402
3K13	3198 031 06890	68Ω 5% 0402
3L00	4822 117 13548	1kΩ 5% 0402
3L04	4822 117 13605	Jumper 0402
3L05	3198 031 01510	150Ω 5% 0.01W 0402
3L06	4822 117 13605	Jumper 0402

3L10	4822 117 13597	330Ω 5% 0402 0.01W
3L11	3198 031 01510	150Ω 5% 0.01W 0402
3L12	4822 117 13548	1kΩ 5% 0402
3L16	4822 117 13605	Jumper 0402
3L17	3198 031 01510	150Ω 5% 0.01W 0402
3L19	3198 031 01510	150Ω 5% 0.01W 0402
3L20	3198 031 01510	150Ω 5% 0.01W 0402
3L21	4822 117 13602	2.2kΩ 5% 0.01W 0402
3L22	4822 117 13602	2.2kΩ 5% 0.01W 0402
3L24	4822 117 13602	2.2kΩ 5% 0.01W 0402
3L25	2350 035 10229	4 x 22Ω 5% 1206
3L26	2350 035 10229	4 x 22Ω 5% 1206
3L27	2350 035 10229	4 x 22Ω 5% 1206
3L28	2350 035 10229	4 x 22Ω 5% 1206
3L30	3198 031 02290	22Ω 5% 0.1W 0402
3L31	3198 031 02290	22Ω 5% 0.1W 0402
3L32	4822 117 13602	2.2kΩ 5% 0.01W 0402
3L33	4822 117 13596	220Ω 5% 0.01W 0402
3L34	4822 117 13605	Jumper 0402
3L35	4822 117 13596	220Ω 5% 0.01W 0402
3L36	3198 031 03320	3.3kΩ 5% 0402
3L37	3198 031 03320	3.3kΩ 5% 0402
3M01	2350 035 10689	4 x 68Ω 5%
3M02	2350 035 10689	4 x 68Ω 5%
3M03	2350 035 10689	4 x 68Ω 5%
3M04	2350 035 10689	4 x 68Ω 5%
3M06	2350 035 10229	4 x 22Ω 5% 1206
3M07	2350 035 10229	4 x 22Ω 5% 1206
3M08	2350 035 10229	4 x 22Ω 5% 1206
3M09	2350 035 10229	4 x 22Ω 5% 1206
3M11	3198 031 04720	4.7kΩ 5% 0402
3M13	3198 031 04720	4.7kΩ 5% 0402
3M14	4822 117 13545	100Ω 1% 0402
3M15	4822 117 13545	100Ω 1% 0402
3M16	3198 031 04720	4.7kΩ 5% 0402
3M26	4822 117 13605	Jumper 0402
3M27	4822 117 13605	Jumper 0402
3M50	4822 117 13606	10kΩ 5% 0.01W 0402
3M51	4822 117 13606	10kΩ 5% 0.01W 0402
3M52	4822 117 13606	10kΩ 5% 0.01W 0402
3M53	4822 117 13546	47Ω 5% 0402
3M54	4822 117 13546	47Ω 5% 0402
3M55	4822 117 13546	47Ω 5% 0402
3M56	4822 117 13606	10kΩ 5% 0.01W 0402
3M57	4822 117 13546	47Ω 5% 0402
3M58	4822 117 13606	10kΩ 5% 0.01W 0402
3M59	4822 117 13546	47Ω 5% 0402
3M78	4822 117 13548	1kΩ 5% 0402
3M79	3198 031 03320	3.3kΩ 5% 0402
3M87	4822 117 13605	Jumper 0402
3M89	3198 031 02290	22Ω 5% 0.1W 0402
3M90	3198 031 02290	22Ω 5% 0.1W 0402
3N01	4822 117 13606	10kΩ 5% 0.01W 0402
3N02	4822 117 13606	10kΩ 5% 0.01W 0402
3N03	4822 117 13606	10kΩ 5% 0.01W 0402
3N04	4822 117 13606	10kΩ 5% 0.01W 0402
3N05	4822 117 13606	10kΩ 5% 0.01W 0402
3N06	4822 117 13606	10kΩ 5% 0.01W 0402
3N07	4822 051 30333	33kΩ 5% 0.062W
3N08	4822 117 13606	10kΩ 5% 0.01W 0402
3N09	4822 117 13548	1kΩ 5% 0402
3N10	4822 117 13603	33kΩ 5% 0402
3N11	4822 117 13546	47Ω 5% 0402
3N12	4822 117 13606	10kΩ 5% 0.01W 0402
3N13	4822 117 13606	10kΩ 5% 0.01W 0402
3N14	4822 117 13606	10kΩ 5% 0.01W 0402
3N15	4822 117 13546	47Ω 5% 0402
3N16	4822 117 13546	47Ω 5% 0402
3N17	4822 117 13546	47Ω 5% 0402
3N18	4822 117 13546	47Ω 5% 0402
3N19	4822 117 13606	10kΩ 5% 0.01W 0402
3N20	4822 117 13546	47Ω 5% 0402
3N21	4822 117 13545	100Ω 1% 0402
3N22	4822 117 13545	100Ω 1% 0402
3N23	4822 117 13545	100Ω 1% 0402
3N24	4822 117 13545	100Ω 1% 0402
3N25	4822 117 13545	100Ω 1% 0402
3N26	3198 031 04720	4.7kΩ 5% 0402
3N27	4822 117 13546	47Ω 5% 0402
3N28	4822 051 30181	180Ω 5% 0.062W
3N29	4822 117 13545	100Ω 1% 0402
3N30	4822 117 13545	100Ω 1% 0402
3N31	4822 117 13545	100Ω 1% 0402
3N32	4822 117 13545	100Ω 1% 0402
3N33	4822 117 13545	100Ω 1% 0402
3N34	4822 117 13545	100Ω 1% 0402
3N35	4822 117 13545	100Ω 1% 0402
3N46	4822 117 13545	100Ω 1% 0402
3N47	4822 117 13545	100Ω 1% 0402
3P01	3198 031 04720	4.7kΩ 5% 0402
3P03	4822 117 13546	47Ω 5% 0402
3S00	4822 117 12925	47kΩ 1% 0.063W 0603
3S03	4822 117 12925	47kΩ 1% 0.063W 0603
4206	4822 051 20008	Jumper 0805

4211	4822 117 13605	Jumper 0402
4212	4822 117 13605	Jumper 0402
4436	4822 117 13605	Jumper 0402
4437	4822 117 13605	Jumper 0402
4440	4822 117 13605	Jumper 0402
4441	4822 117 13605	Jumper 0402
4801	4822 117 13605	Jumper 0402
4A05	4822 117 13605	Jumper 0402
4A06	4822 117 13605	Jumper 0402
4K04	4822 117 13605	Jumper 0402
4K05	4822 117 13605	Jumper 0402
4K06	4822 117 13605	Jumper 0402
4L02	4822 117 13605	Jumper 0402
4M00	4822 117 13605	Jumper 0402
4M01	4822 117 13605	Jumper 0402
4M02	4822 117 13605	Jumper 0402
4M03	4822 117 13605	Jumper 0402
4M05	4822 117 13605	Jumper 0402
4M08	4822 117 13605	Jumper 0402
4M09	4822 117 13605	Jumper 0402
4M10	4822 117 13605	Jumper 0402
4M16	4822 117 13605	Jumper 0402
4M17	4822 117 13605	Jumper 0402
4N01	4822 117 13605	Jumper 0402
4N02	4822 117 13605	Jumper 0402
4N03	4822 117 13605	Jumper 0402
4N04	4822 117 13605	Jumper 0402
4N05	4822 117 13605	Jumper 0402
4N06	4822 117 13605	Jumper 0402
4N07	4822 117 13605	Jumper 0402
4N08	4822 117 13605	Jumper 0402
4N09	4822 117 13605	Jumper 0402
4N10	4822 117 13605	Jumper 0402
4N11	4822 117 13605	Jumper 0402
4N12	4822 117 13605	Jumper 0402
4N13	4822 117 13605	Jumper 0402
4N14	4822 117 13605	Jumper 0402
4N15	4822 117 13605	Jumper 0402
4N16	4822 117 13605	Jumper 0402
4N17	4822 117 13605	Jumper 0402
4N18	4822 117 13605	Jumper 0402
4N19	4822 117 13605	Jumper 0402
4N20	4822 117 13605	Jumper 0402
4N21	4822 117 13605	Jumper 0402
4N22	4822 117 13605	Jumper 0402

5101	3198 018 33970	0.39µF 10% 0805
5103	4822 157 71334	0.68µH 5% 1008
5107	4822 051 30101	100Ω 5% 0.062W
5108	4822 051 30101	100Ω 5% 0.062W
5201	4822 157 11716	Bead 30Ω at 100MHz
5202	4822 157 11716	Bead 30Ω at 100MHz
5203	4822 157 11716	Bead 30Ω at 100MHz
5204	2422 549 42896	Bead 120Ω 100MHz
5205	4822 157 11716	Bead 30Ω at 100MHz
5206	4822 157 11716	Bead 30Ω at 100MHz
5207	2422 549 42896	Bead 120Ω 100MHz
5208	4822 157 11716	Bead 30Ω at 100MHz
5209	4822 157 11716	Bead 30Ω at 100MHz
5210	4822 157 11716	Bead 30Ω at 100MHz
5211	4822 157 11716	Bead 30Ω at 100MHz
5212	4822 157 11716	Bead 30Ω at 100MHz
5213	4822 157 11716	Bead 30Ω at 100MHz
5214	2422 536 00667	1000µF 20% 7032
5216	4822 157 11716	Bead 30Ω at 100MHz
5218	2422 549 45333	Bead 120Ω 100MHz
5700	2422 549 45333	Bead 120Ω 100MHz
5730	2422 535 94134	10µH 20% 0805
5733	2422 536 00689	220µF 20%
5735	2422 536 00667	1000µF 20% 7032
5737	2422 535 94134	10µH 20% 0805
5738	2422 549 45333	Bead 120Ω 100MHz
5752	2422 535 94134	10µH 20% 0805
5753	2422 536 00689	220µF 20%
5754	2422 535 94134	10µH 20% 0805
5756	2422 549 45333	Bead 120Ω 100MHz
5757	2422 549 45333	Bead 120Ω 100MHz
5900	2422 549 45333	Bead 120Ω 100MHz
5901	2422 549 45333	Bead 120Ω 100MHz
5902	2422 549 45333	Bead 120Ω 100MHz
5903	2422 549 45333	Bead 120Ω 100MHz
5904	2422 549 45333	Bead 120Ω 100MHz
5905	2422 549 45333	Bead 120Ω 100MHz
5906	2422 549 45333	Bead 120Ω 100MHz
5907	2422 549 45333	Bead 120Ω 100MHz
5908	2422 549 45333	Bead 120Ω 100MHz
5909	2422 549 45333	Bead 120Ω 100MHz
5910	2422 549 45333	Bead 120Ω 100MHz
5911	2422 549 45333	Bead 120Ω 100MHz
5C00	2422 549 45333	Bead 120Ω 100MHz
5E00	2422 549 45333	Bead 120Ω 100MHz
5E01	2422 549 45333	Bead 120Ω 100MHz
5E02	2422 549 45333	Bead 120Ω 100MHz
5E03	2422 549 45333	Bead 120Ω 100MHz
5F00	2422 549 45333	Bead 120Ω 100MHz
5F01	2422 549 45333	Bead 120Ω 100MHz
5F02	2422 549 45333	Bead 120Ω 100MHz
5F03	2422 549 45333	Bead 120Ω 100MHz
5G02	2422 549 45333	Bead 120Ω 100MHz
5J01	2422 549 42896	Bead 120Ω 100MHz
5J02	2422 549 42896	Bead 120Ω 100MHz
5J03	2422 549 45333	Bead 120Ω 100MHz
5L00	2422 549 45333	Bead 120Ω 100MHz
5L01	2422 549 45333	Bead 120Ω 100MHz
5L02	2422 549 45333	Bead 120Ω 100MHz
5M00	2422 549 45333	Bead 120Ω 100MHz
5M01	2422 549 45333	Bead 120Ω 100MHz
5M02	2422 549 45333	Bead 120Ω 100MHz
5M03	2422 549 45333	Bead 120Ω 100MHz
5M04	2422 549 45333	Bead 120Ω 100MHz
5M05	2422 549 45333	Bead 120Ω 100MHz
5N01	4822 157 11716	Bead 30Ω at 100MHz
5N02	4822 157 11716	Bead 30Ω at 100MHz
5N03	4822 157 11716	Bead 30Ω at 100MHz
5N04	4822 157 11716	Bead 30Ω at 100MHz
5N05	4822 157 11716	Bead 30Ω at 100MHz
5P01	4822 157 11716	Bead 30Ω at 100MHz
5P02	4822 157 11716	Bead 30Ω at 100MHz
5P03	4822 157 11716	Bead 30Ω at 100MHz
5P04	4822 157 11716	Bead 30Ω at 100MHz
5P05	4822 157 11716	Bead 30Ω at 100MHz
5P06	4822 157 11716	Bead 30Ω at 100MHz

6101	4822 130 11416	PDZ6.8B
6102	4822 130 11416	PDZ6.8B
6103	4822 130 11397	BAS316
6104	4822 130 11525	1SS356
6204	4822 130 80622	BAT54
6205	4822 130 80622	BAT54
6430	9340 548 42115	PDZ2.4B
6431	9965 000 20150	1N4148WS SOD-323
6601	4822 130 10838	UDZ3.3B
6733	9322 128 70685	SMSS14
6735	5322 130 34337	BAV99
6736	9340 548 71115	PDZ33B
6751	9322 128 70685	SMSS14
6E01	9322 102 64685	UDZ2.7B
6E03	9322 102 64685	UDZ2.7B
6F00	4822 130 11397	BAS316
6F01	4822 130 11397	BAS316
6G03	4822 130 11416	PDZ6.8B
6G04	4822 130 11416	PDZ6.8B
6G05	4822 130 11416	PDZ6.8B
6G06	4822 130 11416	PDZ6.8B
6G07	4822 130 11416	PDZ6.8B
6G08	4822 130 11416	PDZ6.8B
6G09	4822 130 11416	PDZ6.8B
6G10	4822 130 11416	PDZ6.8B
6N01	9322 085 77685	TLMG3100

7101	3198 010 42310	BC847BW
7201	9340 550 49115	PUMH7
7202	9340 550 49115	PUMH7
7206	4822 130 60373	BC856B
7207	9322 214 45668	M24C16-WMN6P
7208	3198 010 42310	BC847BW
7209	3198 010 42310	BC847BW
7210	3198 010 42310	BC847BW
7214	9339 693 90135	BCP69-25
7215	9339 693 90135	BCP69-25
7216	9340 425 20115	BC847BS
7217	9352 780 22557	TDA15021H/N1B91
7219	4822 209 60792	74HC4053D
7430	4822 130 11155	PDTC114ET
7436	9352 607 39118	74LVC14APW
7601	9322 183 05668	TS482ID
7602	9351 742 70118	74HC08PW
7605	9340 310 50215	PDTA143ET
7606	9340 425 20115	BC847BS
7607	3198 010 42310	BC847BW
7730	9322 191 07668	IC SM L5970D
7735	4822 130 42804	BC817-25
7738	9322 163 24668	L78M08CDT
7752	5322 209 90529	MC34063AD
7754	9322 214 00668	SI2301BDS-E3
7755	4822 130 11155	PDTC114ET
7756	4822 130 11155	PDTC114ET
7758	9322 212 14668	SI4423DY
7801	9322 219 57671	GM1501H-LF-BD

7900	9322 142 88668	LF25CDT
7901	9322 189 19668	LD1086D2T18
7B01	9322 214 42671	K4D263238F-QC50
7C00	9322 205 12671	MX29LV040QC-70G
7C01	9322 206 23668	M24C32-WMN6P
7C02	9322 215 39685	PST596JN
7E00	9322 195 23668	ADG733BRU
7E01	9322 199 80668	SM5301BS-G
7E02	9322 199 56668	ADG781BCP
7E03	4822 209 60792	74HC4053D
7E04	9352 607 39118	74LVC14APW
7E05	9352 607 39118	74LVC14APW
7F03	9322 206 24668	M24C02-WMN6P
7G03	3198 010 42310	BC847BW
7G05	3198 010 42310	BC847BW
7G10	4822 209 60792	74HC4053D
7L01	3198 010 42310	BC847BW
7L02	3198 010 42310	BC847BW
7L03	3198 010 42310	BC847BW
7L04	9322 212 77672	MST9883C-LF-110
7L05	4822 209 17398	LD1117DT33
7L06	9965 000 04199	BSN20
7L07	9965 000 04199	BSN20
7MC0	9322 204 76671	T6TU5XBG-0001
7MC1	9322 206 19672	MSM56V16160F-7T3-FG
7MC3	9322 170 14668	LF15ABDT
7N01	9322 210 01668	EPCS4SI8N
7N02	9322 217 35671	EP1C12F256C8N
7N03	9340 425 20115	BC847BS
7N04	9322 210 59668	THC63LVDF84B
7P01	9322 170 14668	LF15ABDT
7P02	9322 201 03668	THC63LVDM83R

Audio Amplifier Panel [C]

Various

1001	2422 025 09406	Connector 4p m
1002	2422 025 10769	Connector 9p m
1003	2422 025 10768	Connector 3p m

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2001	2020 024 00023	220µ 35V
2002	2238 586 59812	100nF 20% 50V 0603
2003	2238 586 59812	100nF 20% 50V 0603
2004	2020 024 00023	220µ 35V
2006	2020 552 94427	100pF 5% 50V
2007	2020 552 94427	100pF 5% 50V
2008	2020 552 94427	100pF 5% 50V
2009	2020 552 94427	100pF 5% 50V
2010	2238 586 59812	100nF 20% 50V 0603
2011	4822 051 30562	5.6kΩ 5% 0.063W 0603
2012	2020 024 00023	220µ 35V
2013	4822 126 13879	220nF +80-20% 16V
2014	4822 126 14238	2.2nF 50V 0603
2015	4822 126 14238	2.2nF 50V 0603
2016	4822 126 14238	2.2nF 50V 0603
2017	2238 586 59812	100nF 20% 50V 0603
2018	3198 017 31530	15nF 20% 50V 0603
2019	3198 037 52280	2.2µ 50V
2020	4822 126 13883	220pF 5% 50V
2021	4822 126 13883	220pF 5% 50V
2022	4822 126 14076	220nF +80/-20% 25V
2023	4822 121 51252	470nF 5% 63V
2024	2020 012 00036	1000µ 25V
2026	4822 126 13879	220nF +80-20% 16V
2027	2238 586 59812	100nF 20% 50V 0603
2028	2238 586 59812	100nF 20% 50V 0603
2029	2020 024 00023	220µ 35V
2030	4822 126 14238	2.2nF 50V 0603
2031	4822 126 14238	2.2nF 50V 0603
2032	4822 126 14238	2.2nF 50V 0603
2033	4822 126 13879	220nF +80-20% 16V
2034	2238 586 59812	100nF 20% 50V 0603
2035	4822 126 13883	220pF 5% 50V
2036	4822 126 13883	220pF 5% 50V
2037	3198 037 52280	2.2µ 50V
2038	3198 017 31530	15nF 20% 50V 0603
2039	2020 552 96656	10µF 20% 25V 1210
2040	4822 126 13879	220nF +80-20% 16V
2041	2020 552 96656	10µF 20% 25V 1210
2042	4822 121 51252	470nF 5% 63V
2043	2020 012 00036	1000µ 25V
2044	2238 586 59812	100nF 20% 50V 0603
2045	4822 126 14076	220nF +80/-20% 25V
2047	3198 017 41050	1µF 10V 0603
2048	2238 586 59812	100nF 20% 50V 0603
2051	2020 552 94427	100pF 5% 50V
2052	4822 126 14238	2.2nF 50V 0603
2053	4822 126 14238	2.2nF 50V 0603
2054	4822 126 14238	2.2nF 50V 0603
2055	4822 126 14238	2.2nF 50V 0603
2060	4822 126 14238	2.2nF 50V 0603
2061	4822 126 14238	2.2nF 50V 0603
2062	3198 017 34730	47nF 16V 0603
2063	3198 017 34730	47nF 16V 0603
2064	5322 126 11579	3.3nF 10% 63V
2065	5322 126 11579	3.3nF 10% 63V

-WW-

3001	5322 117 11726	10Ω 5%
3003	4822 051 30223	22kΩ 5% 0.062W
3004	4822 051 30103	10kΩ 5% 0.062W
3006	4822 051 30102	1kΩ 5% 0.062W
3007	4822 117 12925	47kΩ 1% 0.063W 0603
3008	4822 051 30222	2.2kΩ 5% 0.062W
3009	4822 117 12891	220kΩ 1%
3010	4822 051 30682	6.8Ω 5% 0.062W
3011	4822 051 30222	2.2kΩ 5% 0.062W
3012	4822 051 20109	10Ω 5% 0.1W
3013	4822 051 30103	10kΩ 5% 0.062W
3014	2322 762 60229	22Ω 5% 1005
3019	4822 051 30103	10kΩ 5% 0.062W
3020	4822 051 30103	10kΩ 5% 0.062W
3021	4822 051 30472	4.7Ω 5% 0.062W
3022	9965 000 23109	22Ω 5% 0603
3023	4822 051 30102	1kΩ 5% 0.062W
3024	4822 117 12925	47kΩ 1% 0.063W 0603
3025	4822 051 30222	2.2kΩ 5% 0.062W
3026	4822 051 30682	6.8Ω 5% 0.062W
3027	4822 117 12891	220kΩ 1%
3028	4822 051 30103	10kΩ 5% 0.062W
3029	4822 051 30222	2.2kΩ 5% 0.062W
3030	4822 051 20109	10Ω 5% 0.1W
3031	2322 762 60229	22Ω 5% 1005
3032	4822 051 30392	3.9Ω 5% 0.063W 0603
3033	4822 051 30103	10kΩ 5% 0.062W
3034	4822 051 30392	3.9Ω 5% 0.063W 0603
3037	4822 051 30392	3.9Ω 5% 0.063W 0603
3039	4822 051 30103	10kΩ 5% 0.062W
3040	4822 051 30103	10kΩ 5% 0.062W
3041	4822 051 30103	10kΩ 5% 0.062W
3042	4822 051 30103	10kΩ 5% 0.062W
3043	4822 051 30103	10kΩ 5% 0.062W
3046	4822 051 30102	1kΩ 5% 0.062W
3047	4822 051 30102	1kΩ 5% 0.062W

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5001	2422 549 44197	Bead 220Ω at 100MHz
5002	3198 018 52280	2.2µF 10% 1008
5003	3198 018 52280	2.2µF 10% 1008
5004	3198 018 52280	2.2µF 10% 1008
5005	3198 018 52280	2.2µF 10% 1008
5006	2422 536 01034	33µ
5007	2422 536 01034	33µ

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6002	4822 130 80622	BAT54
6003	4822 130 80622	BAT54

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7000	9352 760 45118	TDA8931T/N1
7001	9352 760 45118	TDA8931T/N1
7004	9322 209 56685	TL431ACDBV

Keyboard Control Panel [E]

Various

0100	3139 129 90041	PROCESS BOX PCB PNL LFS
0229	3122 120 01701	FACTORY PLATE
1309	4822 276 13775	Switch 1p 0.1A 12V
1310	4822 276 13775	Switch 1p 0.1A 12V
1311	4822 276 13775	Switch 1p 0.1A 12V
1312	4822 276 13775	Switch 1p 0.1A 12V
1313	4822 276 13775	Switch 1p 0.1A 12V
1314	4822 276 13775	Switch 1p 0.1A 12V
1684	4822 267 10459	Connector 3p
8684	3139 131 04421	Cable 03P/340/03P

-WW-

3318	4822 051 30151	150Ω 5% 0.062W
3319	4822 051 30391	390Ω 5% 0.062W
3320	3198 021 31820	1.8kΩ 5% 0.062W 0603
3321	4822 117 12968	820Ω 5% 0.62W
3322	4822 051 30008	Jumper 0603
3323	4822 051 30008	Jumper 0603
3324	4822 051 30561	560Ω 5% 0.062W

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6306	4822 130 11148	UDZ4.7B

Side AV Panel [G]

Various

1301	2422 025 14531	20p f
1301	4822 267 10484	YKF51-5359
1302	2422 025 10738	Connector 6p m
1302	2422 026 05655	Socket CINCH 3P F RDWDYE
1303	2422 026 05059	Connector Phone
1304	2422 025 10772	Connector 12p m
1306	2422 026 05059	Connector Phone
1307	4822 267 10484	YKF51-5359
1308	2422 026 05513	Soc phone 1p

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2301	3198 017 41050	1µF 10V 0603
2302	4822 126 11785	47pF 5% 50V 0603
2302	4822 126 14241	330pF 0603 50V
2303	3198 017 41050	1µF 10V 0603
2304	4822 126 11785	47pF 5% 50V 0603
2304	4822 126 14241	330pF 0603 50V
2305	4822 126 14241	330pF 0603 50V
2306	4822 126 14241	330pF 0603 50V
2307	4822 126 14241	330pF 0603 50V
2308	5322 126 11583	10nF 10% 50V 0603
2309	5322 126 11583	10nF 10% 50V 0603
2310▲	3198 017 41050	1µF 10V 0603
2326	3198 017 41050	1µF 10V 0603

-WW-

3301	4822 051 30101	100Ω 5% 0.062W
3301	4822 051 30759	75Ω 5% 0.062W
3302	4822 051 30109	10Ω 5% 0.062W
3302	4822 051 30759	75Ω 5% 0.062W
3303	4822 051 30109	10Ω 5% 0.062W
3303	4822 051 30221	220Ω 5% 0.062W
3304	4822 051 30223	22kΩ 5% 0.062W
3304	4822 051 30759	75Ω 5% 0.062W
3305	4822 117 12925	47kΩ 1% 0.063W 0603
3305	4822 117 13632	100kΩ 1% 0603 0.62W
3306	4822 051 30153	15kΩ 5% 0.062W
3306	4822 051 30759	75Ω 5% 0.062W
3307	4822 051 30102	1kΩ 5% 0.062W
3307	4822 051 30223	22kΩ 5% 0.062W
3308	4822 051 30153	15kΩ 5% 0.062W
3308	4822 117 12925	47kΩ 1% 0.063W 0603
3309▲	4822 051 30759	75Ω 5% 0.062W
3310▲	4822 051 30563	56kΩ 5% 0.062W
3311	4822 051 30103	10kΩ 5% 0.062W
3325	4822 051 30759	75Ω 5% 0.062W
3326	4822 051 30102	1kΩ 5% 0.062W
3327	4822 117 13632	100kΩ 1% 0603 0.62W
3328	4822 051 30101	100Ω 5% 0.062W
3329	4822 051 30563	56kΩ 5% 0.062W

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6301	9322 129 41685	BZM55-C12
6302	9322 129 41685	BZM55-C12
6303	9322 129 41685	BZM55-C12
6304	9322 129 41685	BZM55-C12
6305	9322 129 41685	BZM55-C12
6306	9322 129 41685	BZM55-C12
6307	9322 129 41685	BZM55-C12
6308	9322 129 41685	BZM55-C12
6310	4822 130 11416	PDZ6.8B
6311	4822 130 11416	PDZ6.8B

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7301▲	4822 130 60373	BC856B
7326	4822 130 60373	BC856B

IR/LED/Light-sensor Panel [J]

Various

0080	3139 120 10171	Light sensor holder
1540	2422 025 10738	Connector 6p m
1870	4822 265 31067	Connector 7p m

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2540	4822 124 41643	100µF 20% 16V
2541	3198 017 41050	1µF 10V 0603
2801	2020 552 96637	10µF 10% 6.3V 0805
2802	2020 552 96637	10µF 10% 6.3V 0805
2803	3198 017 41050	1µF 10V 0603

-WW-

3540	4822 051 30331	330Ω 5% 0.062W
3542	4822 051 30221	220Ω 5% 0.062W
3544	4822 051 30332	3.3Ω 5% 0.062W
3547	3198 021 32250	2.2MΩ 5% 0603
3801	4822 051 30332	3.3Ω 5% 0.062W
3802	4822 051 30331	330Ω 5% 0.062W
3803	4822 051 30221	220Ω 5% 0.062W
3809	3198 021 32250	2.2MΩ 5% 0603

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6540	9322 192 35676	SPR-325MVW
6541	9322 207 16667	TSOP34836LL1B
6801	9322 192 35676	SPR-325MVW
6803	4822 130 11564	UDZ3.9B

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7540	4822 130 60373	BC856B
7541	5322 130 60159	BC846B
7542	5322 130 60159	BC846B
7543	9322 190 43682	BPW34
7801	4822 130 60373	BC856B
7802	9322 207 16667	TSOP34836LL1B
7803	5322 130 60159	BC846B
7804	5322 130 60159	BC846B
7808	9322 190 43682	BPW34

11. Revision List

Manual xxxx xxx xxxx.0
- First release.

Manual xxxx xxx xxxx.1
- Corrected several errors in the text, drawings and spare parts list.

Manual xxxx xxx xxxx.2
- Corrected several errors in the text, drawings and spare parts list.